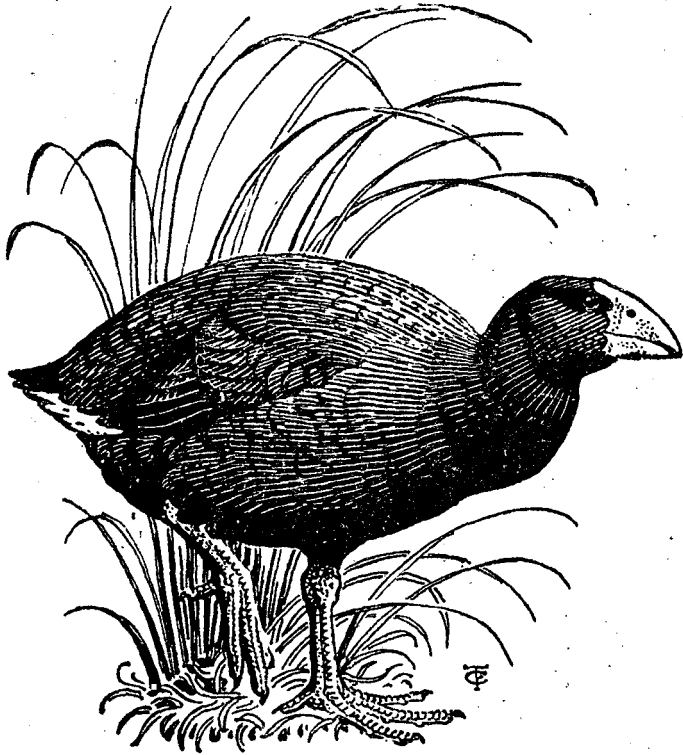


# NOTORNIS



## QUARTERLY BULLETIN

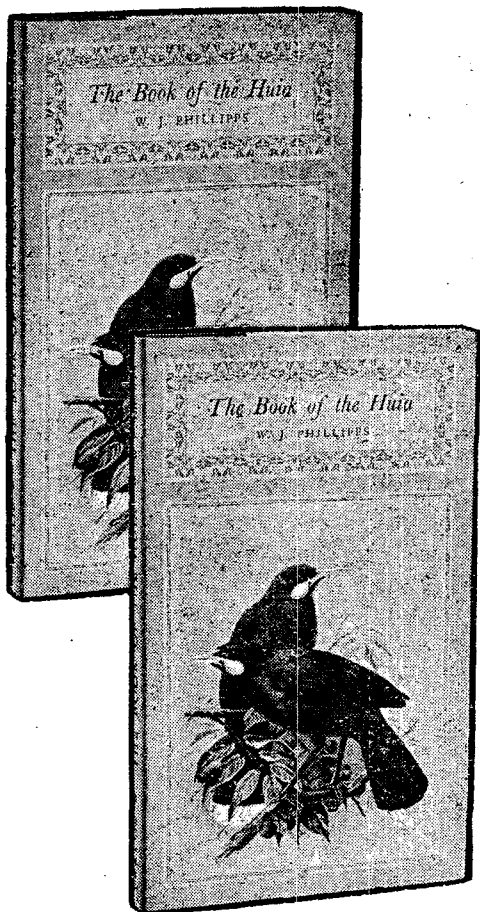
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*Volume Ten, Number Eight, March, 1964*

# THE BOOK OF THE HUIA



**W. J. PHILLIPPS**

Formerly Registrar and  
Ethnologist  
Dominion Museum

"If the huia is indeed extinct," writes Dr. R. A. Falla in his Foreword, "this book will be something of a memorial tribute. If not, the book will provide stimulating background reading for those New Zealanders who, remembering that in 1948 Dr. G. B. Orbell rediscovered an 'extinct' bird in Southland, can see no conclusive reason why the North Island should not provide another rediscovery of equal interest."

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# NOTORNIS

*In continuation of New Zealand Bird Notes*

VOLUME TEN, NUMBER EIGHT - MARCH, NINETEEN SIXTY-THREE

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BULLETIN 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)

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## THE BIRDS OF GREAT BARRIER AND ARID ISLANDS

By B. D. BELL\* and D. H. BRATHWAITE

Great Barrier Island, the largest island lying close off the North Island of New Zealand, is approximately fifty miles north-east of Auckland City. The island is some twenty miles long from north to south, some twelve miles across at its widest portion and has a total area of 74,000 acres. Arid Island is a small island ( $1\frac{1}{2}$  miles by 1 mile) which lies three miles due east of the Whangapoua Beach, its southernmost tip extending to only  $1\frac{3}{4}$  miles from Great Barrier Island.

This paper covers the observations recorded during two official visits. The first visit, to both islands over a period of 10 days in June 1957, was made by the authors to check on the status of Brown Teal on Great Barrier and the North Island Weka on Arid Island. The second, by B. D. Bell and D. V. Merton for 14 days in December 1960, was only to the Great Barrier to make a further check on Brown Teal and to record resident and migratory waders. (The pronoun "we" used in connection with the 1960 observations refers to these, and not the two authors). On this occasion we had about two hours ashore after dark on Saddle Island (Grey Group), a small offlying island, on December 8th. The unpublished observations of several observers are included, and prior published material summarised to give a full picture of the birds of these two islands.

Both islands are hilly and in places very rugged. They have both suffered modification by bush felling and farming. Great Barrier was affected very early by the felling of kauri (*Agathis australis*). Kirk (1867) records that the kauri on the western coast had been largely milled and also that the puriri (*Vitex lucens*) and kanuka (*Leptospermum ericoides*) had become scarce in some districts owing to their being cut for posts and firewood. In 1889 Weetman recorded that "farming had been well established in the south, 'Owena' (*Awana*), Harautanga (*Harataonga*), Whangapoua River, Tapuwai, Fitzroy Harbour and Port Abercrombie." Also the same authority recorded the current activities of gum-diggers.

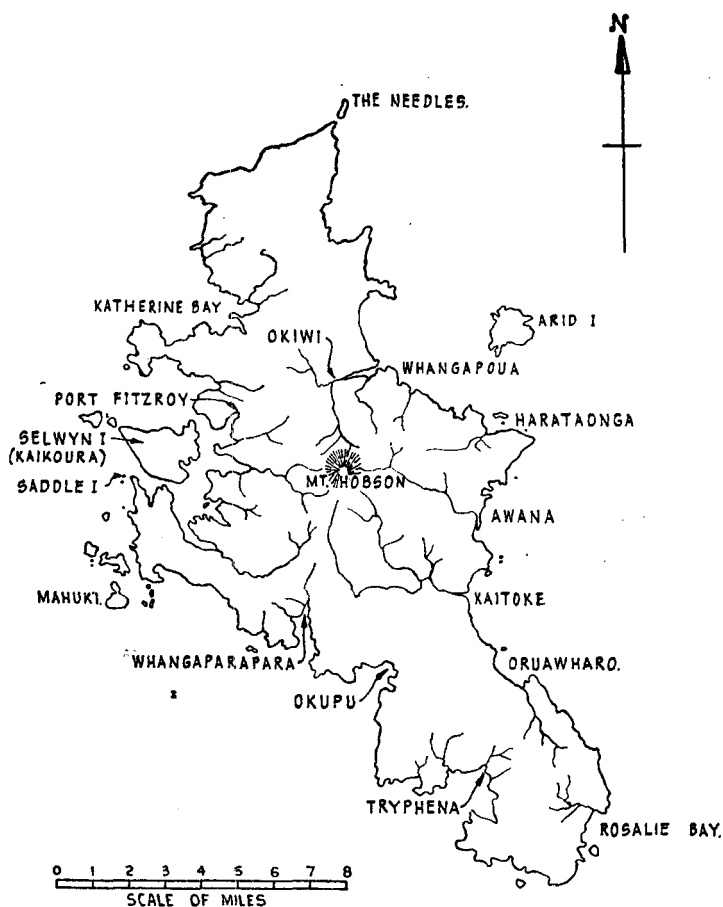
To-day farming has extended a little further inland, but not greatly beyond these areas. Development is retarded by high overhead costs and the conservative nature of the islanders. Farming is a mixture of dairying and sheep and cattle grazing. At least half the island remains in bush, scrub and second growth, and cannot be very different from when Hutton visited it in 1867 except for the effect of repeated burning over the years. The Forest Service now has the large central block reserved and is undertaking a kauri regeneration project. This has meant a prohibition of burning over much of the island in recent years, which has undoubtedly proved beneficial. The northern four or five miles of the island support the only remaining portion of uncut bush.

Hutton and Kirk (1868) described the vegetation of Arid Island as possibly more like that of Little Barrier than of Great Barrier. This island has been partly cleared and has been grazed by cattle for some years so that the remaining bush is very open.

\*Wildlife Branch, Dept. of Internal Affairs

Great Barrier has suffered from the introduction of exotic animals which have an effect on the birds but to a lesser degree than on the mainland. Fallow deer (*Cervus dama*) are present in small numbers on Kaikoura Island. Goats (*Capra hircus*) are spread about the main island and are especially numerous in the northern bush. Wild pigs (*Sus scrota*) have a rather "patchy" distribution. Feral cats (*Felis catus*) are present and rats (*Rattus ?sp.*) are abundant both about the settlements and in the bush. Rabbits (*Oryctolagus cuniculus*) are present in considerable numbers behind Whangapoua Beach and Katherine Bay, and in small numbers throughout the island; and rabbit droppings were found even on the summit of Mount Hobson. Buddle (1936) recorded rabbits on the largest island in the Junction Group. Fortunately both opossums (*Trichosurus vulpecula*) and mustelids are absent. On Arid Island rats (*Rattus sp.*) are numerous and have been present since before 1867 (Hutton and Kirk).

Hutton (1868) drew attention to the absence of the Kiwi and



rails but it is possible that he overlooked the latter. His record of only one species of duck is also strange and it may be that the early settlers and bushmen had reduced the Brown Teal, a very vulnerable species, to a very low level by the time he visited the island so that he did not record it. What we found the most striking was the change in the status of some species since Hutton's day. The apparently complete disappearance of the Robin and Tit seems inexplicable; likewise the virtual disappearance of the Whitehead and Bellbird from Great Barrier while both persist, the Bellbird in good numbers, on the adjacent Arid Island.

As almost no concerted effort has been made over the years to study the birds of Great Barrier Island, it is not surprising that one or two interesting findings were made. The discovery of a colony of Black Petrels and the present high population of the rare Brown Teal must indeed be the highlights. However, strong populations of Banded Rail, Kaka, Kingfisher and Fernbird are also notable. The reported presence of Kokako is worthy of further study. The relatively accurate counts of resident and arctic migrants will be of value to studies of these species elsewhere. Finally the records of the establishment of the White-faced Heron and Myna will provide further evidence in the spread of these species.

#### CLASSIFIED LIST OF SPECIES

As a rule the "Checklist of New Zealand Birds" has been followed for the scientific nomenclature. All place names can be found on New Zealand Topographical Map 1:63360 (1 inch to 1 mile), Sheets N.30 and 31 and N.35 and PT.36. It was found necessary to use the following local place names.

The Needles refers to the Aiguilles Islands and not to only the extreme rock stacks.

Sugarloaf — a conical-shaped peninsula at the north end of Oruawharo Bay.

Walter Blackwell's Creek — a stream north of the Sugarloaf.

Tom Blackwell's Creek — a creek running parallel to the Tryphena - Kaitoke Road to Tryphena.

Sugarloaf Creek — a creek south of the Sugarloaf.

Saltwater Creek — a creek running north into the southern end of Oruawharo Bay.

Mine Bay — a bay south of Miners Head at the north-western end of the island.

#### NORTHERN BLUE PENGUIN (*Eudyptula minor novaehollandiae*)

Reported by Hutton (1868) as very numerous. Hayson (1954) records one washed ashore and remarked on the suitable habitat around the coast. We considered this species still very numerous. In 1957 a dead bird was found on the Awana Beach. On Arid Island their calling could be heard throughout the night. On the evening of the 19th August, 1959, one was seen swimming near the Whangaparapara wharf and later they could be heard calling from other parts of the harbour. In 1960 they were seen in Ports Fitzroy and Abercrombie and outside Man of War Passage. Dead birds were seen at Medlands Beach and Shoal Bay.

## PETRELS

Hutton (1868) listed several species of petrel but gives no breeding data and many of the records are obviously from the seas about Great Barrier. Oliver (1956) also gives Great Barrier as the area where several species have been recorded e.g. Cape Pigeon, Black-bellied Storm Petrel, but these are incidental records and we have referred only to the possible breeding species. To-day, however, it is necessary to mention the concentrations of Wandering Albatrosses, Giant Petrels and Cape Pigeons seen at sea over four days from 18 to 21 of August, 1959, when en route to Cuvier Island. Although the activities of the whaling station at Whangaparapara had finished for the season it could have been largely responsible for the large number of these birds in the surrounding waters. No definite effort was made in 1957 to visit any of the small islands around Great Barrier to determine the species breeding in the area. However, inquiries were made of local people to establish a basis for future work in this quarter. In 1960 B. D. Bell and D. V. Merton accepted the offer of a trip to Saddle Island one evening and this gave us our only opportunity to determine the breeding species on any outlying islet.

### FAIRY PRION (*Pachyptila turtur*)

Recorded breeding on Saddle Island by Sladden (Falla 1934) but not by subsequent observers. Fleming found feathers in January 1934 but no other sign. We saw no sign of this species in 1960.

### FLESH-FOOTED SHEARWATER (*Puffinus carneipes hullianus*)

Fleming (1934) recorded their coming around the boat and diving for bait off Peter Island. Mr. J. Medland reported having seen them off Oruawharo Bay. P. Stein (*pers. com.*) recorded as few as 24 off the Needles with immense numbers of Fluttering and Buller's Shearwaters (see Buller's Shearwater). This species could be the late breeding species recorded by local people from the Needles and Mr. Dick Wii considered this so when questioned about the "muttonbirds" from that area in 1960.

### BULLER'S SHEARWATER (*Puffinus bulleri*)

Falla (1934) queried the possibility of a breeding station off Great Barrier. Stein (*pers. com.*) recorded 20,000+ off the Needles in summer (1956-57). We suspect that these large concentrations which have been recorded off several islands are a form of behaviour during the summer months and that breeding is confined to the Poor Knights.

### SOOTY SHEARWATER (*Puffinus griseus*)

In 1960 (December 13th) three storm-wrecked corpses were found on the Whangapoua Beach. They had probably been present for a month or two.

### FLUTTERING SHEARWATER (*Puffinus gavia*)

Falla (1934) lists Saddle Island as a breeding station. It was found breeding there by Fleming in 1934 and Buddle in 1936. Stein (*pers. com.*) recorded 10,000+ off the Needles (see Buller's Shearwater). In 1960 we found them breeding on Saddle Island, chicks being found in the burrows on December 8th. These were in down with the primaries just breaking their sheaths. Compared with the same species in Cook Strait the adults handled were consistently smaller. One adult was measured and the following data obtained:— bill 34.3, wing 205.5, tarsus 42, mid-toe 45, tail 63 (*measurements in millimetres*).



**BLACK PETREL** (*Procellaria parkinsoni*)

In 1960 the consistent reports of petrels breeding in the vicinity of Mount Hobson caused us to spend a night at the summit on December 9th and this proved most rewarding. A female (Serventy 1956) Black Petrel was found in a burrow just below the summit and the measurements taken:— bill 40 (depth 18, width 18), wing 355, tarsus 56.5, mid-toe 78, tail 111 (*millimetres*). This bird was covering a leaf-lined nest chamber but no egg was present. After dark more petrels began coming in and were very noisy. A rough estimate of the population judging from the birds flying in would be 200+ pairs on Mount Hobson and radiating ridges. Birds became noisy again at 2 a.m. as they began to depart.

Mr. R. Cooper reported "petrels" breeding from "the Drum" (a peak to the south of Mount Hobson) and Mr. Dick Wii reported large black petrels breeding on Cooper's Castle. We heard them flying overhead on several evenings from various places, e.g. Claris Aerodrome, Oruawharo and Shoal Bay. At Claris the birds appeared to be flying towards Te Ahumata. It is considered that this peak and other high points on Great Barrier are possibly used by this species.

**GREY-FACED PETREL** (*Pterodroma macroptera gouldi*)

Hutton and Kirk (1868) visited Arid Island in December 1867 and made the following comment in their paper:— "It is the place where the Maoris always land when they come to eat Mutton-birds. These Mutton-birds, or Oii, as they call them, are a kind of petrel, of a dark brown colour, belonging, we suspect, to the genus *Puffinus*. We were not able to procure a specimen, the season being too far advanced, and saw nothing but feathers lying about where the Maoris had been eating them. These birds live in holes which they burrow into the soft hillsides. We were informed by the natives of the Great Barrier that formerly they used to be very numerous, but that latterly they had become scarce, having been killed off by rats." It is obvious from the above that the species concerned was in fact the Grey-faced Petrel. The Maori name is that used for this species and the breeding season conforms. We found burrows in use in 1957 but were unable to reach a bird. Falla (1934) included the Great Barrier in his general breeding distribution for this species. Fleming (1934) and Buddle (1936) found them breeding on Saddle Island. Buddle also found some burrows on Anvil Island which he took to be these although he was unable to find a bird. We found it breeding on the Sugarloaf and skulls picked up here were identified by E. G. Turbott. The local people told us of several islands where "muttonbirds" nest and from the dates given we suspect that they are this species:— Junction Island, Pitokuku Island, islands off Palmers Point (north of Palmers Beach), islands north of Waikaro and also on a promontory on the main island adjacent to these. On Saddle Island on December 8th, 1960, no adults were coming ashore, but one fully fledged chick with a few wisps of down adhering to its feathers was found.

**[MOTTLED PETREL** (*Pterodroma inexpectata*)

A petrel with a "ti-ti" cry, attributed to this species was heard calling at night, especially rainy nights, during December at Whangaparapara and Port Fitzroy by Fleming (1938). The cry is so similar to that of the following species that confirmation is needed.]

**[COOK'S PETREL (*Pterodroma cooki cooki*)**

Miss L. and Mr. M. Mabey reported having heard a bird passing overhead on summer evenings in the vicinity of the Whangapoua Beach, calling "ti ti ti ti." It is most likely that it was this species flying to the breeding ground on Little Barrier.]

**DIVING PETREL (*Pelecanoides urinatrix*)**

Found on Saddle Island by Fleming (1934) and breeding there by Buddle in 1936. On Saddle Island in 1960 adults were coming ashore in large numbers. Chicks were present in burrows. They were feathered but still covered with a heavy down that was disappearing only from on the head and wings.

**GANNET (*Sula bassana serrator*)**

Hutton (1868) recorded this species as breeding on Mahuki Island, and all subsequent observers have recorded it. The latest published estimate of population was 300-350 pairs in the 1946-47 season (Fleming and Wodzicki 1952). The stack off the south east end of Arid is also given as a roost for this species but breeding has not been recorded. Stein's counts made at the colony from 1954 on, show the actual population is between 800 and 1,000 breeding pairs (*pers. com.*). Birds on Mahuki could be seen from the air as we flew over in 1957 but we did not visit the colony. They were constantly seen all around Great Barrier in both 1957 and 1960.

**BLACK SHAG (*Phalacrocorax carbo novaehollandiae*)**

Fleming (1934) recorded seeing several in Port Fitzroy and Hayson (1954) recorded one from the same area. In 1957 we saw one bird at Port Fitzroy and another at Arid Island. In 1960 four were seen at Whangapoua Estuary and one was seen at each of the following localities, Kaitoke, Sugarloaf and Saltwater Creeks and Shoal Bay. The total number on the island must be rather small.

**PIED SHAG (*Phalacrocorax varius*)**

Recorded by Hutton (1868) as abundant. Both Fleming (1934) and Buddle (1936) recorded a colony (c. 20 nests C.A.F.) on the coast near Flat Island and reported them as common about the coast. In 1938 Fleming recorded a roost of 25 birds between Whangaparapara and Port Fitzroy. In 1957 they were still numerous about the coast and one was seen in the landing bay on Arid Island throughout our stay there. Stein (*pers. com.*) reports a colony of c. 30 nests at north end of Bowling Alley Bay and a small colony behind the islands at the east end of Harataonga Bay. In 1960 odd birds were seen about the coast and small concentrations were recorded on Selwyn Island outside Man of War Passage 6+, Oruawharo Bay 6, and Sandy Bay 10.

**WHITE-THROATED SHAG (*Phalacrocorax melanoleucos brevirostris*)**

Fleming (1938) recorded this species in the Whangaparapara to Port Fitzroy area. In 1957 we saw this species in almost all localities visited. One was seen at Arid Island. In 1960 only ones and twos were seen but they were present on most streams; in fact without exception all those seen were on fresh or estuarine water. Of thirteen seen only one was the white-breasted phase.

**WHITE HERON (*Egretta alba modesta*)**

Johnson (1948) recorded one from Tryphena in May of that year. L. C. Bell (1949) was told by several people that four birds were seen in different parts of the island in the previous summer (1948-49).

Several residents informed us that this species is occasionally seen. Miss Lesley Mabey and Murray Mabey stated that one was seen two or three times a week for a period of two years at the Whangapoua Estuary, either in 1950-51 or 1951-52.

#### BLUE HERON (*Egretta sacra sacra*)

Recorded by Hutton (1868) at Port Fitzroy. Fleming (1934) recorded one near False Head and two at Cliff Island, and in 1938 recorded them between Whangaparapara and Port Fitzroy. In 1957 we saw single birds at Port Fitzroy, Whangaparapara and on the Whangapoua Estuary and two at Tryphena. In 1960 one was seen at Port Fitzroy and Whangaparapara and two at Tryphena.

#### WHITE-FACED HERON (*Ardea novaehollandiae*)

Mr. S. Hailes (Okiwi) reported seeing three or four unusual herons during the previous year or two on various occasions. Although he did not know the bird his description of the plumage and behaviour left little doubt that it was this species.

#### BITTERN (*Botaurus stellaris poiciloptilus*)

Recorded by Hutton (1868) as rare and not seen by him. Similarly L. C. Bell (1949) did not record this species but was told there were a few in the Kaitoke Swamp. In 1957 we saw two birds on Walter Blackwell's Creek and another on Saltwater Creek. The Mabeys stated that the bird was very numerous in the swamp behind Whangapoua Bay. We saw one there in 1960 and also on this visit saw two and heard at least three others in the swamp formed by the backing up of Sugarloaf Creek. 2+ were heard at Kaitoke.

#### BLACK SWAN (*Cygnus atratus*)

L. C. Bell (1949) reported that there are sometimes a few at Whangapoua and Kaitoke. Several residents told us that they are occasional visitors.

#### BROWN TEAL (*Anas castanea chlorotis*)

This species was not listed by Hutton (1868) who commented particularly on the fact that the Grey Duck was the only duck on the island. In 1949 L. C. Bell recorded about 60 Brown Teal but remarked that he did not consider this anywhere near the total population. On a shorter visit in August 1953 he recorded 41 as follows:

At Harataonga he found a pair with a nest containing five eggs in it, with another rat-eaten egg about eight feet away. The nest was on top of the creek bank in long grass about four feet above the water. At Awana he counted 17 including four young. At Tryphena he saw 22 including three broods of six, three and one, when he examined the creek during the middle of the night, whereas none had been seen either at dusk or dawn. Hayson (1954) made reference to them and their nocturnal feeding.

In considering this species it must be appreciated that prior to 1949 this bird was not recognised as protected and was heavily exploited by the local residents. However, since this was pointed out to them by Mr. L. C. Bell on his first visit, they have shown a remarkable co-operation with protection measures. This has undoubtedly assisted the increase of the teal and has been complementary to the habitat changes discussed below.

To the extent that the Brown Teal feeds almost exclusively at night, spending the daylight hours loafing in sheltered creeks, an accurate

census presents a difficult problem. It appears also that the breeding season is far more extended than would appear from the available literature; circumstantial evidence appears to bear out the statements of various residents that the birds nest from May to November. It is thus probable that an unknown proportion of females were on the nest when we were on the island. In fact, in 1957 we gained the impression that males and juveniles formed the majority of some of the flocks we saw.

Our enquiries and discussions with the residents, and our own observations, suggest that the flocks are very sedentary at their loafing places. Mr. Cooper told us that around Port Fitzroy at least, the birds have increased steadily over the past twenty years or so, despite a fair amount of predation by cats and dogs. We believe that this may be related to the taking over of this part of the island by the Forest Service and the subsequent spread of gorse (*Ulex europaeus*) and manuka (*Leptospermum scoparium*) and restrictions on burning throughout much of the island. Mr. Mason says that, in the Oruawharo Bay district, up to the time when shooting the birds for food ceased and for a year or two afterwards, the birds were not common, but that the increase in the past four or five years has been spectacular. We were also informed by several people that the former practice of burning swamp vegetation has more or less ceased. The increase of this species has been paralleled by an increase in both numbers and range of the Banded Rail, though this species also is subjected to predation by cats and dogs. Even the present population of Brown Teal could not maintain its numbers in the face of shooting on the scale apparently carried out up to about 1949, but we believe that the reversion to scrub and second growth of the Forestry block has permitted a steady increase in an area where nesting and loafing habitat exceeded the feeding grounds, and that the consequent surplus maintained a constant influx into the areas where shooting prevented a similar increase until a later date. The cessation of shooting, combined with the regeneration of swamp vegetation, then permitted an even greater increase than on the west coast, as the pasture and beaches provide a much greater area of feeding grounds.

Our estimate of the total numbers of Brown Teal on Great Barrier is based on the assumption that the flocks are, as suggested, sedentary. From our own counts of flocks on creeks visited, and from second-hand estimates or counts on certain other creeks, we have attempted to estimate the populations of the eastern and central parts of the island. In attempting to estimate the populations of other areas, we were compelled to judge the carrying capacity from topographical maps. All our estimates were discussed with residents familiar with the areas concerned; the few disagreements with our estimates were unanimous in considering them too low. Added to the probability, if not certainty, that a fair number of females from the flocks counted were away nesting, this makes us reasonably certain that our estimate of 640-700 birds in 1957 is a conservative one.

Although the residents are now protection-minded in relation to this species and human predation is negligible, there is a certain amount of predation by cats and dogs, as well as casualties caused by motor vehicles, collision with fences and telephone wires, etc. Opinion was unanimous, however, that the birds are not only holding their own but are on the increase. This is borne out very conclusively by the

counts made in 1960 when the total number seen equalled the number estimated in 1957. It has been shown by L. C. Bell (1957) that, where the proper conditions are available, the birds will colonise new areas. We would suggest that Great Barrier Island would be a good locality to carry out a more extended field study of Brown Teal populations, using banding methods to make a more accurate census and to obtain an insight into mortality, survival, movements to and from feeding-grounds, etc.

Localities and counts made during the visits are as follows:—

**Port Fitzroy area:** In 1957 only about six birds seen, but Mr. Cooper reported them to be numerous on his property, and concurred in our estimate of at least 50 birds. In 1960 one was seen and others heard.

**Okiwi and Whangapoua Bay:** In 1957 a flock of 40-50 reported regularly on Mrs. Williams' property by Mrs. Williams and Mr. Stellan. The latter states that Mr. Garth Cooper regularly sees a flock of 40-50 near his place at Okiwi (possibly the same flock but we do not think so). A flock of c. 20 was reported by the Mabey family on their creek at the north end of the bay. Others may be present in the extensive mangrove and freshwater swamps. We believe the population of this area to be at least 150 birds and perhaps 200. In 1960 fourteen were seen at Mr. Hailes' and Mr. Sanderson reported seeing 60-70 in the autumn. We counted 21 on Mabey's stream.

**North Block:** In 1957 Miss Wharfe reported seeing c. 12 birds at Katherine Bay, and two birds were seen last year at Mine Bay. We would guess the population of this area to be at least 40 birds. In 1960 we saw 40-50 on the bank of the stream at Motaihere Bay.

**Harataonga:** In 1957 Mr. Stellan reported seeing about 40 birds here. In 1960 we counted 52+ in this area.

**Awana area:** In 1957 we saw a flock of 36. Very few could definitely be identified as females, and 40 birds is probably a conservative estimate. In 1960 at least 77 were counted.

**Kaitoke Flat:** In 1957 Mr. Daly reported a count of 72 birds on Kaitoke stream within recent weeks prior to our visit. However, we saw none. We saw 32 birds on Walter Blackwell's Creek; this is a permanent flock which comes daily to feed on curds thrown into the creek from the milking shed. This would seem to make a definite minimum of 104 birds. In 1960 Mr. Daly had seen 13 on the Kaitoke River the day we came through but again we did not see any. Most of the population of this stream probably lives up in the swamp area. On Walter Blackwell's Creek we recorded 24+.

**Oruawharo Bay:** In 1957 we saw 80-100 birds on Sugarloaf Creek and 24 on Saltwater Creek on the same afternoon. Mr. Mason agreed that there would be at least 120 birds on these two creeks. In 1960 at least 350 were present on Sugarloaf Creek. The habitat on this stream has improved over the years due to a farm being abandoned and the outlet of the stream becoming blocked. There were 95 on Saltwater Creek. On the bank of this stream D.V.M. found an old nest under an *Astelia*.

**Tryphena:** In 1957 we saw, and watched for some time, a flock of 27 on Tom Blackwell's Creek. B.D.B. saw one bird in the next stream, but the banks were so overgrown, and parts of the creek so hidden by fallen trees, that time did not permit further examination, though

another flock may have been present (an alternative possibility is that the bird was nesting — doubtful, in view of reports that females sit very close on eggs). Also reported on other streams in this area. Our estimate of 50 birds for *Tryphena* was thought much too low by Mr. Tom Blackwell. In 1960 we counted 38 on Tom Blackwell's Creek and three on the Shoal Bay Stream.

South Coast (from Saltwater Creek around to *Tryphena*): No reports in 1957. In 1960 three adults and three half-grown ducklings were seen on the Rosalie Bay Stream.

Whangaparapara - Okupu: Reported as numerous at Whangaparapara by Mr. McGeady in 1957. No reports for Okupu. Our guess is about 50 birds at least for the coast from *Tryphena* to Whangaparapara. From there to Port Fitzroy, the coast, as seen from the launch, did not appear likely to provide any good feeding grounds. In 1960 local residents reported Teal from both Okupu and Whangaparapara but none was seen.

#### GREY DUCK (*Anas superciliosa*)

Recorded by Hutton as not numerous. L. C. Bell (1949) reported that occasionally there are a few at Kaitoke. In 1957 we saw one flock of 23 at Awana and another of about eight at Sugarloaf Creek, both flocks in company with Brown Teal. Mr. Mason considered that there are not more than 20 birds in the Oruawharo Bay area. The total population was probably less than 100. In 1960 its numbers were generally higher than those on the earlier visit. At Whangaparapara one was seen, while at Kaitoke six were recorded. However, as with the Brown Teal the largest concentration was in the Sugarloaf and Saltwater Creeks and here at least 40 were seen. The overall population is probably higher than in 1957 but probably not much greater than our original estimate.

#### MALLARD (*Anas platyrhynchos*)

One female seen on Sugarloaf Creek in 1960.

#### HARRIER (*Circus approximans gouldi*)

Recorded by Hutton as common. C. A. Fleming (1934) recorded evidence of a harrier on Saddle Island and recorded it on Great Barrier in 1938. It was listed by L. C. Bell (1949) and recorded as plentiful by Hayson. At the present time it is distributed generally over the whole island and some outliers. In 1957 we saw at least one almost every day, but did not consider it specially numerous in comparison with many parts of the mainland. L. C. Bell (1953) recorded it from Arid Island and we saw a single bird on two occasions over Arid Island. In 1960 it was seen regularly throughout but never in large numbers. One was seen over Saddle Island before dusk on our evening visit to that island.

#### NEW ZEALAND FALCON (*Falco novaeseelandiae*)

None of our informants had ever seen this species and its disappearance since Hutton's day seems likely.

#### NEW ZEALAND QUAIL (*Coturnix novaeseelandiae*)

Hutton quoted a correspondent from the Bay of Islands who claimed to remember this species as being common on Flat Island at one time but he (Hutton) stated that it was extinct there in 1867 and had been so for several years past.

**BROWN QUAIL** (*Synoicus ypsilophorus*)

Listed by L. C. Bell in 1949. In 1957 we saw several coveys in the Okiwi-Whangapoua district. Others were reported in the Orua-wharo district. Mr. Brown believes there has been some decrease in numbers. In 1960 we did not succeed in seeing any but heard them calling at Whangapoua, Awana and Kaitoke. They seemed particularly numerous at the latter site.

**[CALIFORNIA QUAIL** (*Lophortyx californica brunnescens*)

A pair recorded by Hayson (1954). This is the only record of this species from the island and as the bird is unknown to the local people the record needs confirmation.]

**PHEASANT** (*Phasianus colchicus*)

Listed by L. C. Bell (1949) and Hayson. In 1957 we saw two birds at Whangaparapara and six at Okiwi (all hens). Mr. Brown, a keen pheasant shooter, says they are "patchy" in distribution, and not numerous anywhere. He has not noticed any change in numbers in the last nine years. Mr. Mason says they are common on his property and Mr. Daly reports them as common near the Claris aerodrome. Mr. Barleyman, who has a farm at Kaitoke, claims that pheasants were so numerous that prior to our visit they destroyed an entire crop of newly sown grass. In 1960 they were well distributed through farming and scrub country over the whole island.

**BANDED RAIL** (*Rallus philippensis assimilis*)

In view of Hutton's particular comment on the entire absence of any species of rail, the very presence of this rail, now so rare in most parts of the mainland, is noteworthy in itself. We were even less prepared to find it so widespread and numerous as it proved to be. L. C. Bell had recorded it in 1949 and stated that it was reported to be increasing. Mr. R. Cooper states that he has noticed a steady increase in both numbers and distribution over the past twenty years or so. We suspect this is to be correlated with the reported cessation of the former practice of burning off the swamp vegetation annually. We saw two birds at Whangaparapara, one at Okiwi, one on two occasions at Awana and heard another at Whangapoua Bay. They are reported to be numerous and breeding at Whangaparapara. Mr. Cooper is quite definite that prior to about twenty years ago they were rarely seen. In 1960 it was reported from Port Fitzroy and Whangaparapara by the Forest Service employees. Two were seen at Whangapoua and one of these flew when surprised. One was seen near Mr. G. Cooper's house at Okiwi where the school master reported them common and mischievous in the garden. One was seen at Awana and several were heard calling about the Kaitoke Flats at night.

**NORTH ISLAND WEKA** (*Gallirallus australis greyi*)

Thirteen birds were released by Internal Affairs Department on Arid Island on 22/10/51. Our visit to Arid Island was primarily to investigate the success of this liberation. We found them to be so timid that on our traverse we saw only two birds and heard not more than two others scurrying away. In every case the least movement or sound on our part sent the bird running for cover. Neither of us has ever known wekas to be so timid and can only attribute this to persecution by dogs when the stock was being mustered some six months earlier. Numbers could only be estimated by listening to calls from

a hillside in the central valley during the evening. On this basis, we believe that there are at least 20 birds on the island, but doubt very much whether there are as many as 40. P. Stein (*pers. com.*) visited the island in January 1960 and reported wekas easily found. The caretaker of the island, Mr. R. Davies, gave him an estimate of the population as up to 100. This indicates a substantial increase since 1957.

#### PUKEKO (*Porphyrio melanotus*)

Hutton commented on the absence of this species, but Weetman, only 20 years later, said it was heard but very seldom seen in the swamp at the base of Ahumata. L. C. Bell saw one in 1949. In 1957 we saw two on Walter Blackwell's Creek and four at Awana. Mr. Brown told us there were quite a few at Kaitoke and Mr. Mason reported them present at the back of his property, adding that they do valuable work clearing aquatic weed from his drain ditches. In 1960 there appeared to have been a considerable increase. The greatest concentration was at Sugarloaf Creek where we saw c. 30, including at least one immature bird. Here Mr. G. Mason records having counted 70. Elsewhere it was seen at Okiwi, two; Awana, one; Kaitoke, two; Walter Blackwell's Creek, five; and Saltwater Creek, three. Footprints were common on the track leading along the Kaitoke Swamp on the way to Whangaparapara.

#### SOUTH ISLAND PIED OYSTERCATCHER (*Haematopus ostralegus finschi*)

In 1957 on the tidal flats at Whangapoua Estuary, we noticed two pied birds with the sharply defined breast pattern of *finschi* among a group of the following species. They also appeared smaller than the others and when flushed the extensive area of white on the backs between the wings was plainly seen by both of us.

#### NORTHERN OYSTERCATCHER (*Haematopus unicolor reischeki*)

Hutton recorded this species on the east coast. C. A. Fleming (1934) recorded a pair of black birds from Whangapoua. They were also listed from here by L. C. Bell (1949) and Hayson. In 1957 we saw ten birds in one flock on the tidal flats of Whangapoua Bay, four of these exhibiting varying degrees of pied plumage, including two in such perfect pied form that we had to flush them before we could be absolutely certain that they did not belong to the preceding species. The species is reported to occur often on Medlands Beach, Oruawhoro Bay, where D.H.B. saw two.

Our summer visit in 1960 gave us a better opportunity to establish the population of this oystercatcher. At Katherine Bay (Kawa) there were five (three blacks and two pied.) The main concentration was on the Whangapoua Estuary and Beach and here there were six or seven pairs. All appeared to have eggs or chicks. We were able to find six chicks (three almost fledged, two half grown and one quarter grown) and a nest with two eggs. The parents of the three larger chicks were pied and black but the chicks were all in the pied plumage. At Kaitoke there were three pairs and a solitary bird. All but one of these were black. One pair (smudgy-black) had two almost fledged chicks which were black and pied. Another pair had one egg. One black, possibly the mate of the solitary bird at Kaitoke Beach, was seen at Medlands Beach and a pair was seen at Shoal Bay. A pair was reported to live at Okupu but we did not see them. It would be safe to say the total adult population would be at least 14 pairs.



**GOLDEN PLOVER** (*Charadrius dominicus fulvus*)

Six on pools at Whangapoua Spit on 13/12/60.

**BANDED DOTTEREL** (*Charadrius bicinctus*)

Recorded by L. C. Bell in 1949. We saw at least 30 or 40 birds feeding on the tidal flats of Whangapoua Bay in 1957. In 1960 we counted c. 40 on the Whangapoua Estuary and Beach and found one nest with two eggs. About 20 birds were on Kaitoke Beach and one at Medlands Beach.

**NEW ZEALAND DOTTEREL** (*Charadrius obscurus*)

Reported by Hutton as common on the east coast. Recorded by L. C. Bell in 1949. In 1957 we counted 8 or 10 pairs feeding along the edge of the Whangapoua estuary. There appeared to be some tendency to associate in pairs and most birds were assuming breeding plumage. In 1960 we saw 20-30 including two almost fledged young at Whangapoua Estuary. All birds were in very pale plumage. Three pairs and a single bird were at Kaitoke Beach.

**SHORE PLOVER** (*Thinornis novaeseelandiae*)

Formerly present, reported by Hutton at Whangapoua.

**WRYBILL** (*Anarhynchus frontalis*)

A single bird was seen on the tidal flats at Whangapoua Estuary in 1957.

**WHIMBREL** (*Numenius phaeopus*)

Miss L. Mabey is quite certain that she has seen among the flocks of godwit a bird similar in size and colour to that species but with down-curved bill. This statement was volunteered without any prompting from us. Whimbrel have been recorded at Mokohinau and Cuvier (1933) and Great Mercury (1962) Islands.

**BAR-TAILED GODWIT** (*Limosa lapponica baueri*)

Recorded by Hutton on the east coast. C. A. Fleming (1934) saw a great number of birds at a distance at Whangapoua which he took to be godwits. In 1957 the Mabeys estimated that the flocks which spend the summer on the Whangapoua Estuary number 400 to 500 birds but if this is correct it seems strange that we saw no wintering birds. In 1960 we were able to make an accurate census and counted 149 on the Whangapoua Estuary and three on Kaitoke Beach. At Whangapoua they roost on the Spit at high water. Mr. Mabey reported it usual for some to stay over winter.

**PIED STILT** (*Himantopus himantopus leucocephalus*)

C. A. Fleming recorded two at Whangapoua in 1934 and it was recorded again by L. C. Bell in 1949. D.H.B. saw four birds on Medlands Beach, Oruawharo Bay, and about twelve were seen on the Whangapoua tidal flats. This species appears to be relatively less common than on comparable areas of the mainland. In 1960 at least 12 adults and one chick were seen at Whangapoua Estuary. A nest with five eggs was found on top of a sand dune and several addled eggs were seen about the Spit. There were five adults at Kaitoke Beach and four in the swamp at Sugarloaf Creek.

**ARCTIC SKUA** (*Stercorarius parasiticus*)

One seen off Saddle Island, pale phase 8/12/60.

**BLACK-BACKED GULL** (*Larus dominicanus*)

Listed by Hutton (1868) and L. C. Bell (1949). C. A. Fleming (1934) recorded that this species appeared to be breeding near False

Head. In 1957 this species appeared to us to be less numerous than on most parts of the mainland and discussions with residents seemed to confirm this impression. In 1960 we were again surprised by the scarcity of the species, the largest concentration being seven at Tryphena. Nesting appears to be limited to outlying islets and only on the rock stacks off Kaitoke and Oruawharo Bay did we see any possible nesting, by a single pair in each case.

#### RED-BILLED GULL (*Larus novaehollandiae scopulinus*)

Listed by Hutton. C. A. Fleming (1934) saw adults with flying young at Port Fitzroy. He was told that this species used to nest (some 20 nests) on a rock near Pig Island but gave up after having their eggs regularly taken. Recorded by L. C. Bell in 1949. P. Stein (*pers. com.*) records between 8,000 and 9,000 red-billed gulls at sea between the Needles and Rosalie Bay via Arid Island in the summer of 1956/57. At the same time as few as six Black-backed Gulls were seen.

In 1957 we saw it in small numbers around the coast and, like the preceding species, it seemed less numerous than on the mainland. Mr. Mason, however, reported them to be very common at times, crowding around the sties when the pigs were being fed. On the late afternoon of 19th June a flock estimated at c. 300 was gathering on the Whangapoua tidal flats, being constantly augmented by small groups coming in from the coast. This may have been a communal roost and the flock possibly represented a large part of the total population. In 1960 this species was notably rare. In fact not more than ten birds would have been seen during our stay. This no doubt was because the birds were away at the breeding colonies.

#### CASPIAN TERN (*Hydroprogne caspia*)

Hutton saw two at Whangapoua. It was recorded by L. C. Bell (1949) and Hayson (1954). In 1957 we saw single birds at Kaitoke and Tryphena. In 1960 they were not in greater numbers. Two were seen at Whangapoua and Kaitoke while single birds were recorded at Kaiarara and Shoal Bay. From the behaviour described by Messrs. F. Mabey and S. Hailes independently, it is evident that an occasional pair nests at Whangapoua at times.

#### WHITE-FRONTED TERN (*Sterna striata*)

Reported by Hutton to be abundant. C. A. Fleming (1934) saw adults with flying young at Port Fitzroy. Recorded by Hayson (1954). In 1957 we saw only one bird flying offshore at the north end of the island. Mr. Brown stated that they are numerous at regular intervals and that he had seen the Tryphena Wharf white with droppings from resting birds. In 1960 we saw c. 12 in Port Fitzroy and presumed them to be nesting on a low rock in the middle of the harbour. Mr. R. Cooper reported that they breed annually on this but outside the harbour along the west coast they are more erratic. Apart from these only small numbers were seen elsewhere, Whangapoua Estuary, Kaitoke and Shoal Bay.

#### NEW ZEALAND PIGEON (*Hemiphaga novaeseelandiae*)

Hutton listed this species without comment. Weetman reported this and the Tui as the most numerous species on the island. C. A. Fleming (1938) recorded it in the bush and L. C. Bell (1949) recorded it and noted it feeding on the nikau (*Rhopalostylis sapida*) berries. It

was recorded again by Hayson. In 1957 it appeared to us to exist in reasonably large numbers. Single birds were often seen in the bush country and we saw one flock of 23 flying high in the area above the hills overlooking Tryphena. Mr. G. Mason told me he had seen pigeons flying from Little Barrier to Great Barrier. In 1960 we found it still well distributed over the main island and it was seen at almost every locality. No large flock was seen as on the earlier visit but this could have been due to the season.

It was listed by Hutton and Kirk from Arid Island and again later by Falla (1933) and L. C. Bell (1953). We estimated the number on Arid Island in 1957 as between 25 and 50. Some were noted eating taraire (*Beilschmiedia Tairairi*) berries but the birds were unusually timid and difficult to approach.

#### KAKA (*Nestor meridionalis septentrionalis*)

Hutton stated this species was not common. C. A. Fleming (1934) recorded seeing two and hearing others behind Fitzroy. Again in 1938 Fleming reported Kaka abundant and found a nest on the Whangaparapara-Port Fitzroy track. L. C. Bell (1949) reported it not abundant and Hayson (1954) listed it. We saw single birds and pairs at Tryphena, Kaiarara (Port Fitzroy), Mount Hobson and in the bush behind (south of) Rangiwhakaea Bay in 1957. Both Mr. Cooper and Mr. Daly considered them to have increased in recent years. They are to be seen in groups of six and sometimes eight to ten when the pohutukawa (*Metrosideros excelsa*) is in flower at Port Fitzroy and Tryphena. In 1960 we found them still very well distributed throughout the bush areas of the island and we saw them in almost all the suitable areas visited. One was seen to fly from a point south of Harataonga out to Arid Island.

Falla recorded it from Arid Island in 1933. Wilson (1959) records a nest found by Buddle in January 1944. One was seen by L. C. Bell (1953). We saw a flock of five on two occasions and this probably represented the entire population in 1957.

#### RED-CROWNED PARAKEET (*Cyanoramphus novaeseelandiae*)

#### YELLOW-CROWNED PARAKEET (*Cyanoramphus auriceps*)

Both species were reported as common by Hutton. Of our various informants in 1957 only Mr. Leroy (Port Fitzroy) claimed to have identified both species on the island. Mr. Little, who knows both, has only seen Red-crowned and this was the only species identified by other informants. We did not see either species on the main island. However in 1960 we saw one in the distance on Mount Hobson and heard another in the same area.

L. C. Bell (1953) identified the birds seen on Arid Island as Red-crowned, as does Stein (*pers. com.*). In 1957 we heard parakeets in two places and saw two. These unfortunately flew between us and the sun so that we could not determine the species.

#### SHINING CUCKOO (*Chalcites lucidus*)

Listed by Hutton. Fleming (1934) saw a young bird being fed by Grey Warblers and again in 1938 saw Grey Warblers feeding young cuckoos which had left the nest. In 1960 this species was heard calling throughout the island. It appears to be a common summer migrant.

#### LONG-TAILED CUCKOO (*Eudynamis taitensis*)

Listed by Hutton. Mr. Cooper told us that this species was

formerly fairly common in the north block but it is now rarely seen there. Mr. Mason stated that it was present in his district each season and could be heard calling throughout the night. It would be interesting to know what species it is parasitizing in the apparent absence of Whiteheads.

**MOREPORK** (*Ninox novaeseelandiae*)

Recorded by Hutton (1868), L. C. Bell (1949) and Hayson. In 1957 we heard birds calling at Oruawhoro Bay and at Port Fitzroy. Heard at Arid Island where the population is perhaps five or six pairs. In 1960 it was heard calling from all localities and is obviously relatively abundant.

**KINGFISHER** (*Halcyon sanctus vagans*)

Recorded by Hutton. Fleming records finding a nest with five hard-sat eggs in 1938. In 1949 L. C. Bell reported it abundant. In 1957 we found this species to be very abundant in most parts of the island, particularly on the east coast where it was usual to have four or five in sight at one time. On Arid Island it was recorded by Falla (1933) and L. C. Bell (1935). We saw it there a few times but it was not common.

In 1960 this species was most numerous and I cannot recall seeing a higher population elsewhere. The only area they were not present was the sand dune country. Almost every road cutting had either occupied or old nest burrows. Those occupied were in all cases too long to determine the stage nesting had reached. However, one was being built on 14/12/60. Five nests in use were seen in road cuttings and one in a stream bank. One interesting site was found in the end of a log in the middle of the bush on the track to Mount Hobson. Considering no active effort was made to find nests, the recording of seven gives some indication of the density of this species.

**BROAD-BILLED ROLLER** (*Eurystomus orientalis pacificus*)

The Checklist (1953) records the occurrence of this species on Great Barrier Island in 1935.

**RIFLEMAN** (*Acanthisitta chloris*)

Recorded by Hutton at Harataonga, a place we did not visit in 1957. We saw no sign of the species, neither on our brief trip into the bush behind Rangiwahakaea Bay nor on the trip to Mount Hobson.

**SKYLARK** (*Alauda arvensis*)

Recorded by L. C. Bell (1949) and as common by Hayson. In both 1957 and 1960 it was fairly common in all suitable habitat on Great Barrier. Fairly numerous on Arid Island, but less so than the pipit.

**FANTAIL** (*Rhipidura fuliginosa*)

Reported by Hutton to be common. Recorded as the commonest species by L. C. Bell (1949) and as abundant by Hayson. We saw it in all localities visited in normal numbers. Recorded by Hutton and Kirk, Falla (1933) and L. C. Bell (1953) from Arid Island, where we found it in similar numbers to the mainland. In 1960 it was most abundant throughout but the density tapered off over 1500 ft. on Mount Hobson. On 12/12/60 a pair was seen feeding three young away from the nest.

**PIED TIT** (*Petroica macrocephala toitoi*)

Hutton listed this species but gave no indication, as to its

abundance. Of all our informants, in 1957 only Mr. D. Stelling thought he had seen it but we found it difficult to believe that the species could be present at all on the island without being widespread throughout the vast areas of scrub and second growth. There is so much habitat of the type wherein one would expect to find this species in numbers that its apparent disappearance since Hutton's visit is not easy to understand.

Listed from Arid Island by Hutton and Kirk but not by subsequent observers.

#### NORTH ISLAND ROBIN (*Petroica australis longipes*)

Hutton recorded this species as common. None of our informants knew it despite large areas of what appeared to be suitable habitat. The disappearance of this species, too, is difficult to understand.

#### FERNBIRD (*Bowdleria punctata*)

Recorded by Hutton at Kaitoke swamp where there is still much suitable habitat. Recorded by L. C. Bell (1949). We saw one bird south of Kaitoke at Oruawharo Bay and another to the north at Awana in 1957. In 1960 we recorded this species from the swamp behind the Whangapoua Estuary, Kaitoke Flats and Swamp from the track from Whangaparapara to Okupu and from the road from Okupu to Kaitoke. In all areas it appears abundant.

#### WHITEHEAD (*Mohoua albicilla*)

Reported by Hutton to be very common. (A small flock was recorded by Hayson). It was not known to any of our informants on Great Barrier, though persisting in small numbers on Arid, where Falla listed it in 1933 and L. C. Bell in 1953 saw one. A flock of about six was seen twice during our stay there in 1957.

#### GREY WARBLER (*Gerygone igata*)

Reported common by Hutton. Fleming saw warblers feeding young cuckoos in 1931 and 1938. Reported by L. C. Bell as the second commonest species and again as abundant by Hayson in 1954. In 1957 and 1960 we heard songs everywhere and saw a number of birds. Numbers appeared to be normal on Great Barrier and Arid Islands. On Arid, it was recorded by Falla (1933) and L. C. Bell (1953).

#### SONG THRUSH (*Turdus ericetorum*)

A dead young bird was found by Fleming (1934) on Saddle Island. Recorded by L. C. Bell (1949) and as common by Hayson. It was fairly numerous except in heavy bush during our two visits in 1957 and 1960. One was seen on Arid Island.

#### BLACKBIRD (*Turdus merula*)

Recorded by L. C. Bell in 1949 and as common by Hayson. We found it generally distributed and fairly numerous in both 1957 and 1960. On Arid it was recorded by Falla (1933) and L. C. Bell (1953). We saw a female and heard one other bird.

#### HEDGE SPARROW (*Prunella modularis*)

Recorded by L. C. Bell in 1949 and seen by us at Port Fitzroy, Kaiarara and Oruawharo Bay in 1957. Two were seen in the bushed gullies on Arid Island. In 1960 it was seen and heard throughout in similar numbers to what would be expected on the mainland.

#### PIPIT (*Anthus novaeseelandiae*)

Reported by Hutton to be common and Hayson as very numerous.

In 1957 we found this still so in all suitable habitat. Hutton and Kirk listed it from Arid Island and also L. C. Bell (1953). It was numerous around the coast and on rocky outcrops on the hills during our stay. In 1960 we found it still well represented throughout.

STITCHBIRD (*Notiomystis cincta*)

Recorded by Hutton as not uncommon. Now absent.

BELLBIRD (*Anthornis melanura*)

Recorded by Hutton to be abundant. Only 20 years later, Weetman saw and heard a single pair at the head of the Whangaparapara Harbour and remarked they seemed scarce. It was stated by several of our informants to be still present though rare. We neither saw nor heard it on Great Barrier.

It was recorded on Arid Island by Hutton and Kirk, Falla (1933) and L. C. Bell (1953). It is still numerous and was heard constantly throughout the day.

TUI (*Prothemadera novaeseelandiae*)

Reported by Hutton to be very abundant and Weetman 20 years later considered this and the pigeon to be the most numerous species on the island. C. A. Fleming (1938) recorded it as abundant and it was listed by Bell in 1949 and Hayson. In 1957 it was still generally distributed over the islands but apparently not in large numbers. Mr. Mason considers the species to be noticeably less in number than it was 12 years ago. In 1960 we found it to be in good numbers throughout and if anything more numerous than on our former visit. However this may have been because the pohutukawa flowering was attracting them to the more accessible area. This was not the case on the way to Mount Hobson and notwithstanding it was just as numerous.

Listed from Arid by Hutton and Kirk, and Falla (1933). We saw a few on Arid Island where they were noted feeding on *kolchokohe* (*Dysoxylum spectabile*) berries and nectar.

WHITE-EYE (*Zosterops lateralis*)

Hutton did not see this bird but was informed that it had been on the island since about 1864. It was recorded by L. C. Bell (1949) and Hayson. In 1957 we found it generally distributed though apparently in no great numbers. Falla (1933) listed it on Arid Island and we recorded a single bird there. In 1960 we found it well distributed throughout (including Saddle Island) but apparently only in small flocks or family parties.

GREENFINCH (*Chloris chloris*)

In 1957 we saw one bird at Okiwi and another at Kaitoke. However, in 1960 we found it well distributed on the eastern side of the island and also in the south.

GOLDFINCH (*Carduelis carduelis*)

Recorded by L. C. Bell (1949) and as common by Hayson. In 1957 it was seen in several places but not noticeably abundant. Odd individuals and a flock of about 20 were seen on Arid Island. In 1960 it was present throughout and occasionally a largish flock was seen.

REDPOLL (*Carduelis flammea*)

Not recorded in 1957 although Miss Wharfe reported having seen it. In 1960 we saw a small flock of about six behind the Whangapoua Estuary and a single bird over the Whangapoua Spit. Consider-

ing the amount of what appears suitable habitat this species must be taken as rare.

**CHAFFINCH** (*Fringilla coelebs*)

Recorded by L. C. Bell (1949). In 1957 we found this species to be common in bush areas. At Whangaparapara it was reported by Mr. McGeady to take *Pinus* seeds from the nursery garden. In 1960 it was common throughout. Falla recorded it (1933) on Arid where we saw one and heard another.

**YELLOWHAMMER** (*Emberiza citrinella*)

Recorded by L. C. Bell (1949) and from more open spaces by Hayson. In 1957 this species was seen in limited numbers. On Arid, one individual and a flock of four was seen. In 1960 it was seen on the southern half of the eastern coast but only in small numbers.

**HOUSE SPARROW** (*Passer domesticus*)

Recorded by L. C. Bell (1949) and Hayson. In 1957 present in normal numbers around all habitations. One pair resident near the hut on Arid Island. In 1960 the position of this species was the same.

**STARLING** (*Sturnus vulgaris*)

C. A. Fleming (1934) recorded it from Saddle Island. Reported as abundant by L. C. Bell (1949) and Hayson. Flocks numbering upwards of 50 birds were seen at Whangapoua, Oruawhoro Bay and Kaitoke but compared with the numbers on parts of the mainland, the species does not appear to be particularly abundant.

In 1960 the population was still large and well distributed throughout the island. On Saddle Island a flock of 20+ was feeding on flowering pohutukawa.

On Arid Island, it was recorded by Falla (1933) and L. C. Bell (1953). A flock of 40 to 50 rested near the hut during our visit.

**INDIAN MYNA** (*Acridotheres tristis*)

In 1960 we saw two mynas flying over the Whangapoua Spit and later saw two (possibly the same birds) in a puriri at Mr. S. Hailes' who told us that a small group had been present for about a year. This probably records the establishment of another introduced species on Great Barrier.

**MAGPIE** (*Gymnorhina* sp.)

L. C. Bell reported one had appeared after a storm in 1949. Reported by two of our informants (in 1957) to occur but only as stragglers from the mainland.

**SADDLEBACK** (*Philesturnus carunculatus rufusater*)

Reported by Hutton to be not uncommon. Now absent.

**KOKAKO** (*Callaeas cinerea wilsoni*)

Hutton listed this species without any comment but there appeared to be no subsequent records until the presence of a bird on the dividing range between Tapuwai and Katherine Bay was reported to L. C. Bell, though he did not see it himself. Mr. Mason claimed to have seen two birds at Mount Hobson 15 years ago and described them to us. It may still exist somewhere in this area but all other reports pertain to the north block. In 1933 or thereabouts a freshly dead bird with another, presumably its mate, still nearby, was found by an employee of Mr. F. Mabey three miles north of Whangapoua Bay. Murray Mabey told us that his father had said that this was the first

seen for some 25 years. Another bird was seen by Mr. Murray Mabey at the same place late in 1955. We visited the locality with him but neither saw nor heard any sign of the species. After leaving the island a letter was received from Miss L. Mabey dated 24th July, 1957, which informed us that on the previous Sunday her brother and a friend had seen a pair of Kokako near the spot we had visited.

#### ACKNOWLEDGEMENTS

We wish to record our appreciation for the help given by Mr. D. V. Merton who accompanied B.D.B. in 1960 and who contributed in no small measure to the success of this trip. Also we wish to thank Drs. R. A. Falla and C. A. Fleming who have made available some of their unpublished notes; Mr. E. G. Turbott who made available some unpublished field notes of the late Major G. A. Buddle which are now in his keeping and to Mr. P. A. S. Stein for allowing me to use some of his observations from his wealth of experience about Hauraki Gulf. R.A.F., C.A.F., P.A.S.S. and Dr. K. E. Westerskov also kindly checked the text. Finally I would like to thank all residents of the Great Barrier Island for their hospitality to us on both occasions and their willingness to discuss the birds of the island with us. I would especially like to mention the following: Misses Wharfc (District Nurse 1957) and L. Mabey, Messrs. A. Brown (former Police Constable), R. Little (Forest Service 1957), A. Dean (Forest Service 1960), T. Daly (Ministry of Works), P. McGeady (Forest Service), T. Blackwell, R. Cooper, S. Hailes, F. and M. Mabey, J. Medland, D. Stellin and G. Mason.

#### ADDENDA TO BIRDS OF GREAT BARRIER ISLAND

Mr. D. V. Merton re-visited the Great Barrier Island between the 8th and 18th of October, 1963. He has some additional information on the birds of the island which he has kindly made available for inclusion at the end of my paper.

##### PETREL sp.

On the summit of Mount Hobson on 14/10/63 he found that in addition to the Black Petrel, a small *Pterodroma* was circling and calling overhead. Small, freshly cleaned burrows presumably belonging to this species were found but no birds were actually seen on the ground.

##### WHITE-FACED HERON

One was seen at Oruawhoro Bay on 9/10/63 and another at Whangaparapara on 17/10/63.

##### CALIFORNIAN QUAIL

Two pairs were seen on the road behind the Whangapoua Estuary on 13/10/63. They were also heard calling at Okiwi and Kaitoke.

##### CASPIAN TERN

One nest with two eggs was found at the mouth of the Kaitoke River on 9/10/63.

##### MYNA

The birds seen in 1960 have apparently failed to establish as they were not recorded during Mr. Merton's recent visit.



## KOKAKO

The most notable of Mr. Merton's finds was a strong colony of Kokako in the Ahuriri River catchment. This valley has a heavily wooded basin of taraire/tawa (*Beilschmiedia tawa*) bush. One bird was observed feeding on the young leaves of mapou (*Myrsine australis*) and the fertile fronds of *Lygodium articulatum*.

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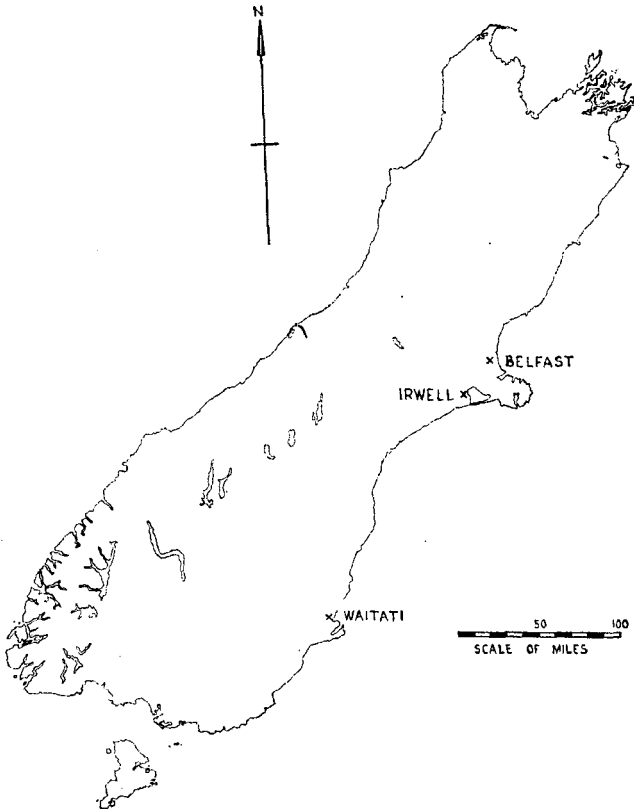
## CATTLE EGRET: A SECOND CANTERBURY RECORD

By E. G. TURBOTT, Canterbury Museum

On 1/1/64 Messrs. A. G. McFarlane and J. G. Penniket, of Christchurch, on a visit to the Irwell district (about 25 miles by road southwest of Christchurch on the western shore of Lake Ellesmere) saw a buff-headed white heron, evidently a Cattle Egret (*Ardeola ibis*), with a dairy herd: I visited the farm on 5/1/64, and on this visit the bird was seen in full view feeding in shallow water at the far end of the field from the herd. It was wading in a shallow pool adjacent to the lake edge, and was feeding in the water in company with three White-faced Herons. When the four birds were at last disturbed the White-faced Herons flew off, but the Cattle Egret flew to the end of the field and settled on a fallen log near the cows.

The bird was in breeding plumage — white with orange-buff head and face (except for chin and area surrounding eye), throat, upper breast and dorsal train; the buff coloration formed a V down the sides of the neck and across the throat and upper breast; facial skin pinkish; bill yellow, with a faint dark portion at the tip; feet greenish-grey. The head was strongly crested.

According to Mr. A. Patterson, on whose farm the bird was seen, it was first noted in September when it was seen regularly for some weeks, but disappeared for a fairly long period probably in October, and has been seen constantly since its return at some time in November. It is usual for the bird to obtain its food from the grass close to the cows, but sometimes it has been seen feeding in shallow pools. It is tame, and has often been seen at close quarters. As the Cattle Egret previously recorded at Belfast, North Canterbury (Turbott, Brathwaite and Wilkin, 1963) was observed regularly in September, the bird at Irwell is clearly a new one.



#### CATTLE EGRETS AT BELFAST AND WAITATI: FURTHER NOTES

The Egret reported at Belfast (Turbott, Brathwaite and Wilkin, *ibid.*) was seen by a number of observers on visits between 28/9/63 and 26/10/63: the most interesting feature of these visits was that the bird was then in the process of changing into breeding plumage. On 13/10/63 Messrs. D. H. Brathwaite and B. Ellis observed it at close quarters, noting that a wash of very pale buff had appeared on crown, nape and hindneck; the same was recorded by Mr. J. R. Jackson and

the writer on 17/10/63 and the additional observation made that the bill showed dark shading and an overall distinctly pinkish tinge. On 26/10/63 various members of the Ornithological Society of New Zealand taking part in a field study week-end obtained good views — the buff feathers on crown and nape had lengthened and the buff coloration intensified; the buff dorsal train had appeared and there was now a little buff on the breast. From soon after this date the bird deserted this farm — it had been observed regularly by the farmer, Mr. B. F. Johns, since May — and enquiries in the district provided no evidence of its whereabouts until 9-10/1/64 when a farm hand again saw it with Mr. Johns' cows; it had disappeared again, however, on 11/1/64.

As mentioned in an editorial comment on the record of the Cattle Egret seen at Belfast (Turbott, Brathwaite and Wilkin, *ibid.*), a "young" white heron thought probably to be a Cattle Egret had earlier spent some time in the Waitati Valley (approximately 17 miles by road to the north of Dunedin). I am most grateful to Mrs. L. E. Walker and Mr. John Allan for additional information on the record.

The bird was recorded at Waitati by Mrs. B. Kelly, who observed it during a period from March to May, 1963 (arrived in last week of March, last seen approximately third week of May). During this time it was seen regularly with a dairy herd adjacent to the fish hatcheries; it was seen for most of the time with the same herd, but would disappear periodically and enquiries by Mrs. Kelly did not produce any records from other farmers in the district. The bird could be approached as closely as 20 feet.

It will be noted that this bird was last seen at approximately the same time as Mr. Johns' first record on his farm at Belfast. However, experience of the Cattle Egrets so far recorded in New Zealand has shown that the bird's presence in a district may remain unrecorded, and it would be rash to credit the Waitati Egret with having moved quarters to Belfast.

I am much indebted to Mr. D. H. Brathwaite for drawing the map accompanying this paper.

#### REFERENCE

Turbott, E. G., Brathwaite, D. H., and Wilkin, F. E., 1963 — Cattle Egret: A New Bird for New Zealand. *Notornis* 10: 316.

[Correction: Mr. Wilkin's name was incorrectly given as "F. W. Wilkin" in *Notornis* Vol. 10, p. 316. — Ed.]

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#### NOTICE

Beach Patrol Records for 1963 are now being analysed. Would people who have not sent in their 1963 records kindly do so as soon as possible to the undersigned.

B. W. Boeson, P.O. Box 30, Carterton.

## CORROSIVE ACTION OF THERMAL WATER ON THE WEBBING OF WATERBIRDS IN LAKES AROUND ROTORUA

By M. J. DANIEL

The curative properties of mineral waters the world over and of the thermal waters around Rotorua in particular, are well known. However the harmful effects of these hot to scalding acidic and alkaline waters on the vulnerable webbing of palmate birds does not seem to have been recorded before to my knowledge.

### OBSERVATIONS

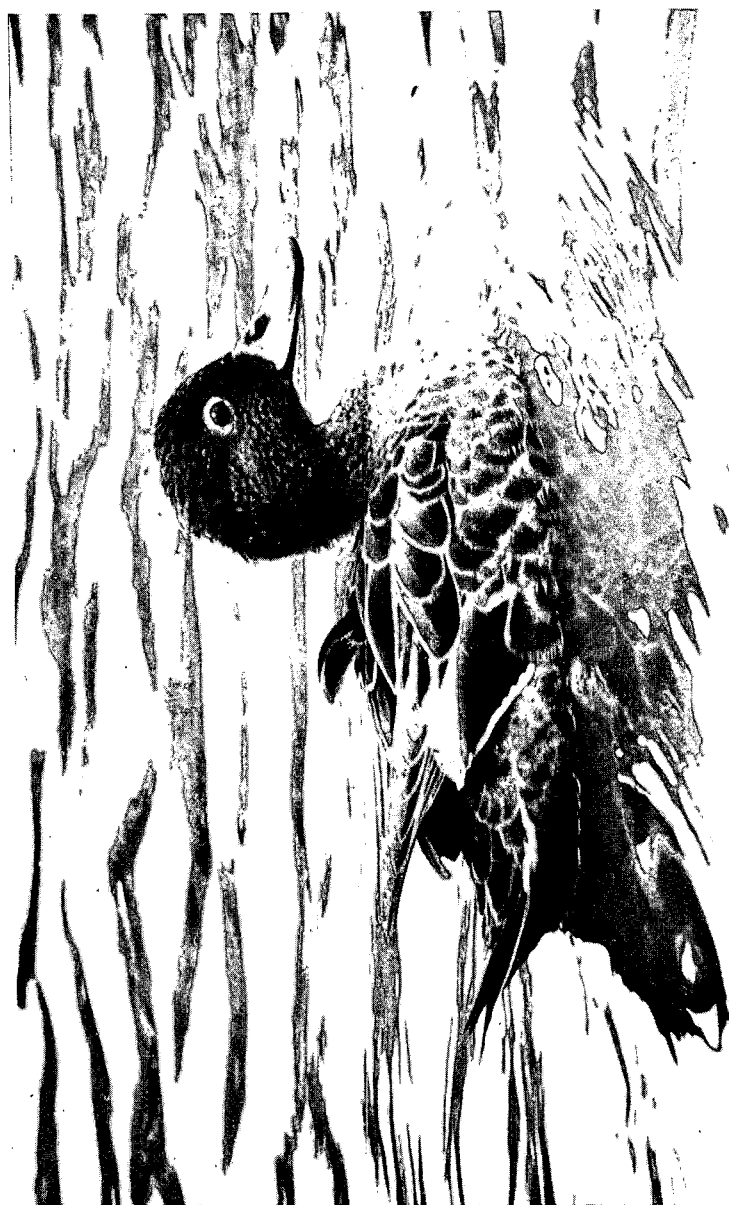
During a recent small study of Black-billed Gulls (*Larus bulleri*) nesting on thermal ground in the Whakarewarewa reserve (Daniel, 1963), it was noticed particularly on Lake Rotorua, that a significant number of Red-billed Gulls (*Larus novaehollandiae scopulinus*) had either no webbing at all or only webbing on one foot. Several surveys of the relatively tame red-billed gulls feeding on the lakefront revealed that as many as 20% of small flocks had lost some or all their webbing. Table 1 gives details of one survey taken in August 1963 of a flock of 30 gulls on the Rotorua lakefront.

TABLE 1: Incidence of web damage in a flock of 30 red-billed gulls

<i>Species and age</i>	<i>Observation of feet</i>
1 adult gull.	No webs on either foot.
1 adult gull.	Web on one side of left, none on right
1 adult gull.	No webs or toes, only stumps.
1 juvenile gull.	No webs on either foot.
1 juvenile gull.	No webs on either foot.
1 juvenile gull.	None on left, normal on right.
24 adult & juvenile gulls.	Normal palmarion on both feet.
Total = 6/30, an incidence of 20%	

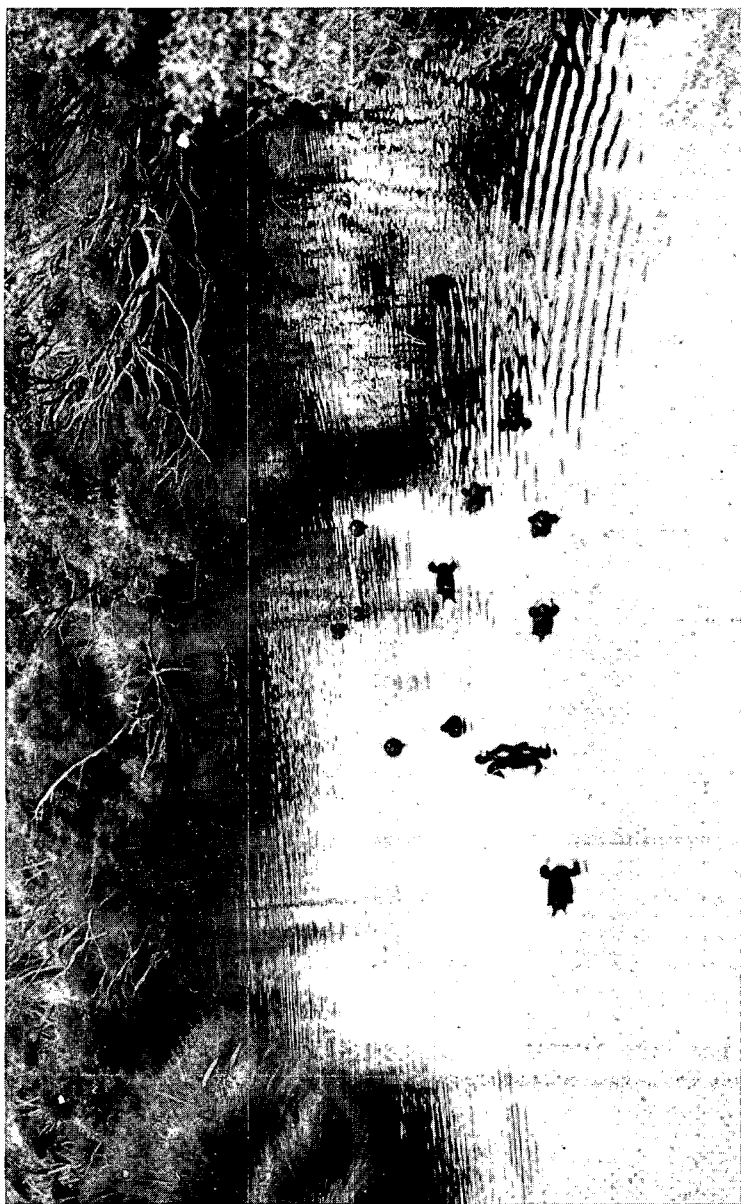
It can be seen from Table 1 that both adult and juvenile gulls were found affected. In one case, an adult gull as well as losing all its webbing, had also lost all its digits, leaving only two red stumps. Whether this small sample is representative of the several hundred gulls of three species nesting at Sulphur Point on Lake Rotorua (Black, 1955), is not known. Plates 1 and 2 show some of these affected gulls. These observations were taken at very close range, less than five yards. At ranges greater than this it was difficult to see the details of the palmarion, particularly when the bird was flying. This may explain why this phenomenon has not been recorded before to my knowledge. Several attempts were made to examine the webbing of the gulls at Sulphur Point with a telescope, but it was found that the details could not be determined.

This corrosive action on webbing is not confined to gulls however. Field Officer A. G. Hall of the Wildlife Branch informed me that he had observed it in Mallards, Scaup and in Black Swans on Lake Rotomahana. He found in a sample of 20 swans that 15 or 75% had one or more of their webs missing. Again it is not known if this is a real sample of the estimated 5000 swans on this lake, a wildlife refuge.



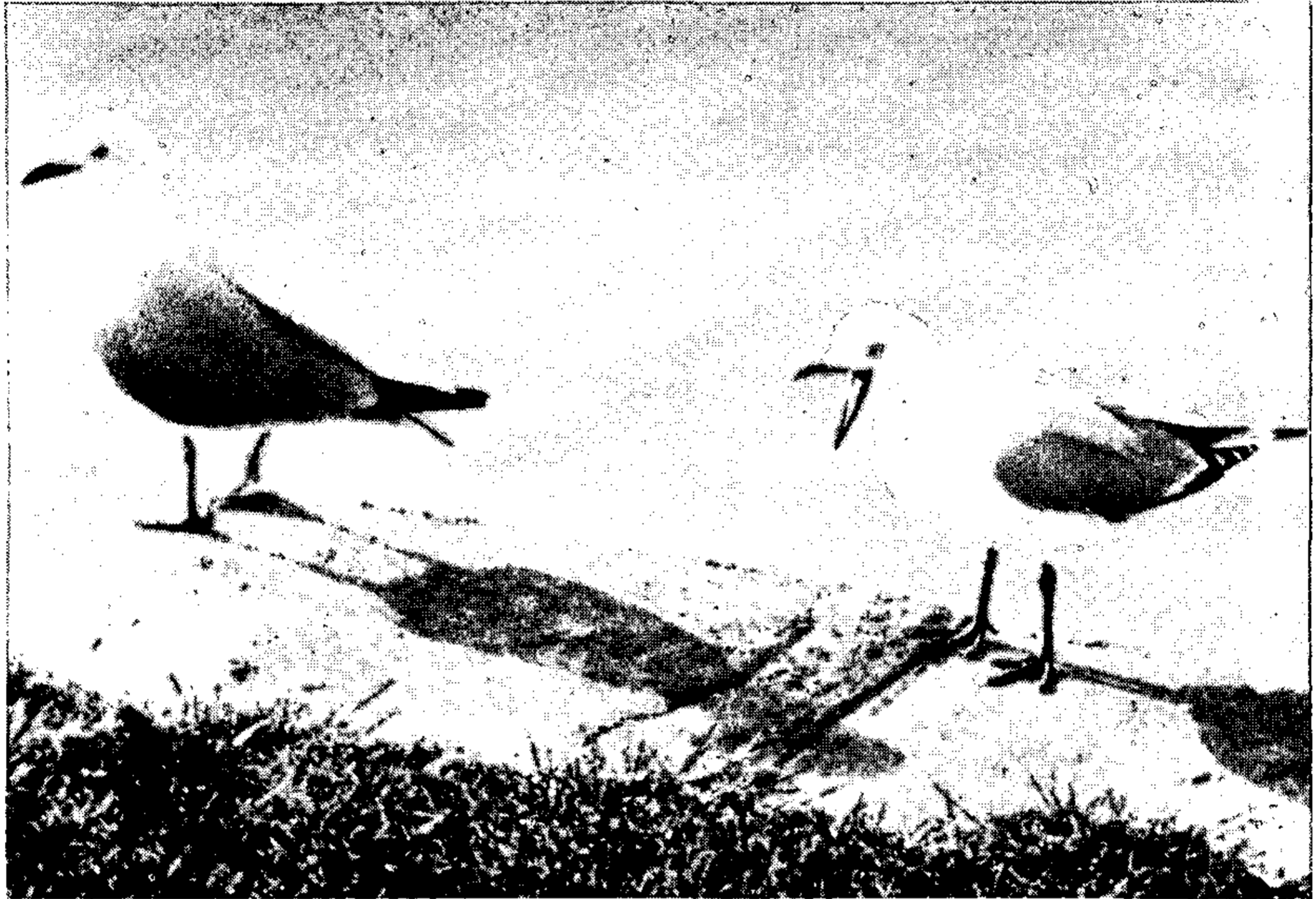
[D. V. Merton

XLV — Brown Teal (female), one of a flock of c. 350 on Sugarloaf Creek in 1960.



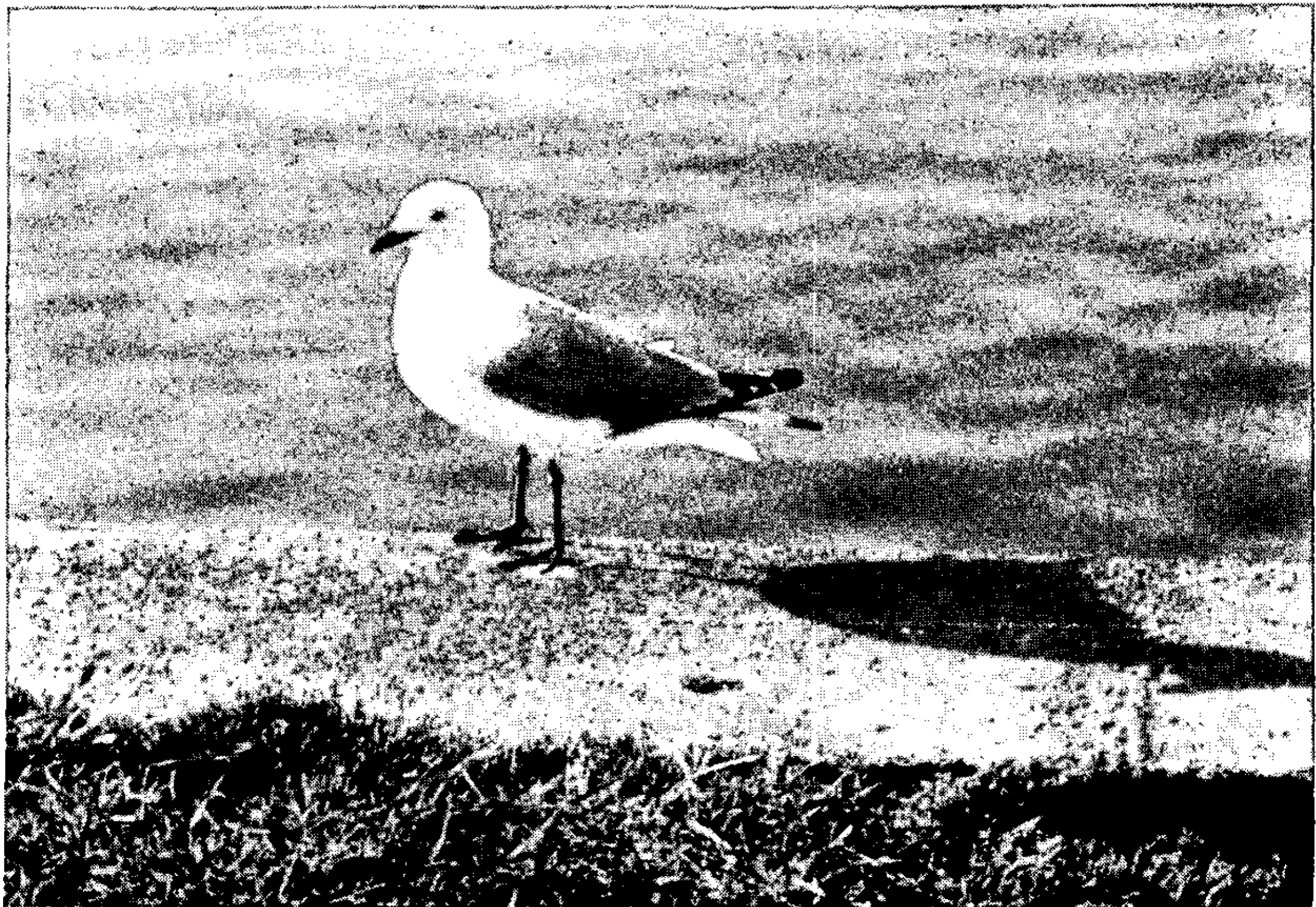
[D. V. Merton

XLVI — The Awana River, showing typical habitat of Brown Teal. The overhanging trees on the right are used for loafing during the day. The teal in the foreground are part of a flock of 75+ recorded in 1960.



[M. J. Daniel

XLVII (a) — The adult Red-billed Gull on the right has no webs on the left foot but both on the right foot. The other gull is normal. Lake Rotorua.



[M. J. Daniel

XLVII (b) — Adult Red-billed Gull with no webs on either foot. Lake Rotorua.



[D. H. Brathwaite

XLVIII (a) — Cattle Egret: telephoto of the bird observed at Belfast, near Christchurch (taken 13/10/63, by which date it had pale buff crown, nape and hindneck).



[M. J. Hogg

XLVIII (b) — Pycroft's Petrel (*P. pycrofti*) on the forest floor of Marotiri (Big Chicken) in December 1962, when it was one of six species of tubinares coming ashore. Blue Penguins, tuatara and kiore also compete for burrow-housing.



A checklist of the birds recorded around the thermal lakes on the volcanic plateau kindly supplied by Mr. Max Black, reveals that there are at least 15 species of palmate birds. These include 3 species of gulls, 4 species of shags, 6 species of ducks and one species each of terns and swans. It would be interesting to find out whether more than the 4 species recorded in this preliminary study have been found affected by the corrosive water.

#### METHODS

Besides direct observation at close range of the 3 species of gulls, water samples were taken at several sites and analysed for temperature, hydrogen ion concentration (pH value), chloride and sulphate ion concentrations.

#### RESULTS AND DISCUSSION

There can be little doubt that the relatively thin and insensitive skin of the webbing of these palmate species has been literally "eaten away" by either the acidic or alkaline waters of the hot lakes in this region.

According to Grange (1937) in his bulletin on the composition and temperature of all the lakes and springs in the thermal region around Rotorua, the various springs, lakelets and lakes vary markedly in their acidic and alkaline properties, mineral content and amount of total dissolved solids. Even one small lakelet can vary from strongly acidic to alkaline within only a few yards. An example of this is in Roto-a-Tamaheke, where the Black-billed Gull study was done. Where the water is boiling it is alkaline (pH = 8.3), but a few yards away in the turbid shallow area it is highly acidic (pH = 3.2). The temperatures also vary greatly from about 158 degrees Fahr. to 208 degrees Fahr.

Grange (*op. cit.*) states that the acidity of the lakes and springs is due to free sulphuric and hydrochloric acids and to a lesser extent to aluminium sulphate, while the alkalinity is caused by the alkali carbonates and to a lesser extent to borates and silicates.

Some water samples collected in Lake Rotorua in open water near the Sulphur Point gull colony give hydrogen ion concentrations as acidic as 3.0 (the pH varied from 3.2 to 3.0). The chloride ion values for these same sites varied from 49.5 to 56.5 ppm and the sulphate values varied from 148 to 172 ppm. The water temperature varied from 18 to 20 degrees Centigrade (64 to 68 degrees Fahr.). Samples taken from Roto-a-Tamaheke in the Whakarewarewa thermal reserve, gave a pH range of highly acidic (pH = 3.2), to alkaline (pH = 8.4). The chloride range was from 594 to 763 ppm and the sulphate from 95 to 295 ppm.

Since gulls' feet were not available to test how quickly this corrosion effect might be taking place, a stag's head complete with antlers was lowered into a hot pool at Whakarewarewa with a pH of 8.4 (thus alkaline not acidic), and a temperature of 208 degrees Fahr. After 24 hours of immersion it was found that both the skull and the antlers were completely decalcified and crumbled away in the fingers. This was dramatic proof of the speed of the corrosive action in not a highly acidic pool but an alkaline one.

This demonstration shows that for palmate species swimming in lakes like Rotorua or Rotomahana which have "hot spots" and which are highly acidic or alkaline, it would be quite possible for them to lose their webbing, probably without any pain, since their feet are

notoriously insensitive to high and low temperatures. An example of this is the fact that gulls stand, sometimes on one foot, on the hot steam pipes behind the Queen Elizabeth Hospital on the Lakefront. These pipes are far too hot to touch with the hand. At the other end of the temperature scale, I have seen several species of ducks, particularly the four species of eiders and the Long-tailed Duck, standing for hours on ice and perma-frosted ground in the north of Alaska waiting for a lead to open up in the sea ice. However in the literature available to me I was unable to find any reference to work done on the lack of feeling in the feet of palmate species.

It seems probable that the corrosive action of these acidic and alkaline thermal waters is enhanced both by the high water temperatures in some areas of the lakes and by the buffering chemical action caused by the high concentrations of dissolved salts and solids.

Besides the one adult red-billed gull observed without any digits (Table 1), several gulls of this species have been seen with only one leg. At first it was assumed that either opossum traps or vandalism by children was the cause of this, but after the antler demonstration it might be the more dramatic and serious effect of the corrosive water.

In a discussion by Wodzicki and Robertson (1959) on the effects of volcanic activity on the birdlife of White Island, they mention that the red-billed gulls nesting at Crater Bay have had their plumage corroded away leaving only the bare shafts, giving the birds the appearance of being in full moult. They conclude that this is due to the action of acid water in both the acid stream and Crater Bay in which the gulls frequently bathe. It is surprising that no effects were noticed among the gannets, apart from the "bluish haze" which hangs over the gannetries caused by the hydrochloric acid in the air acting on the ammonia in the excrement on the ground, forming ammonium chloride. Surely here if anywhere you would expect to find corrosion of the feet of palmate species.

No plumage damage due to thermal water has been observed on this study of the gulls on the Rotorua lakes. This could possibly be because the acidity of the water where the gulls feed is not as high as that experienced off White Island.

The effect of the loss of some or all of the webbing to a palmate species is probably quite severe. It was observed that the gulls with no webbing at all had some difficulty in getting off the water and off dry land. It would also presumably markedly effect their powers of swimming and feeding, particularly in species like the ducks and the Black Swan. It would be interesting to learn whether similar corrosive effects on palmate species have been observed and recorded in the thermal regions of Italy, Iceland and California.

#### ACKNOWLEDGMENTS

I am indebted to Mr. Max Black, Mr. Peter Bull and Dr. Kaj Westerskov for comment and to Mr. N. H. Cummins and Mr. R. Glover for the pH, chloride and sulphate determinations.

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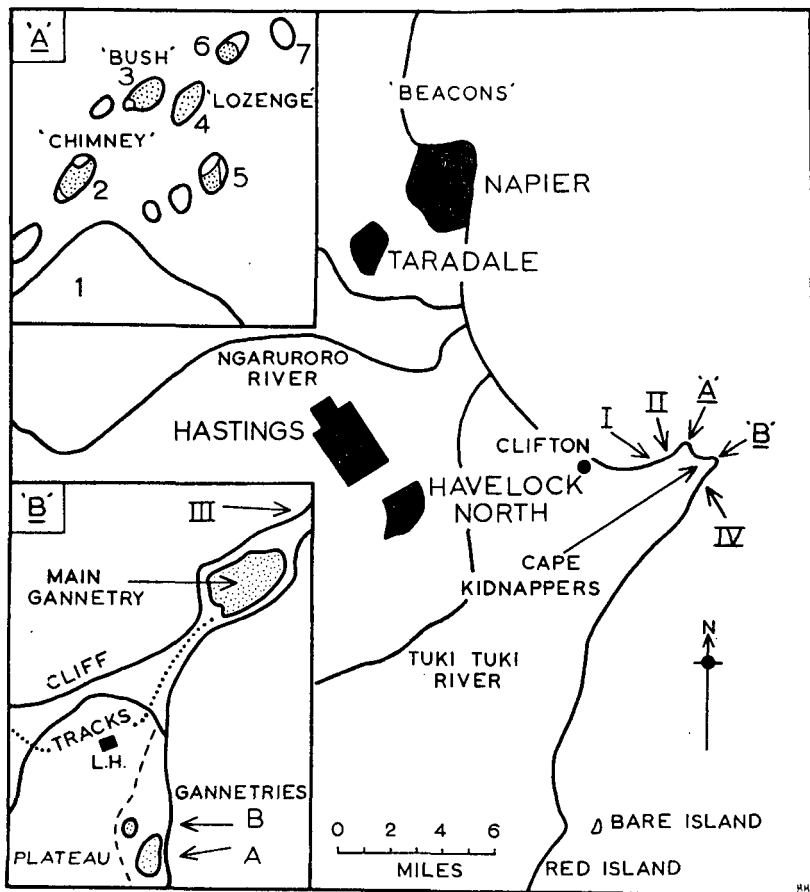
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## OBSERVATIONS ON BLACK-BACKED GULL PREDATION AT THE CAPE KIDNAPPERS GANNETRIES: 1959 - 1963

By C. J. R. ROBERTSON

### INTRODUCTION

The Gannet (*Sula bassana serrator*) breeds at Cape Kidnappers, Hawke's Bay, in three different areas (Fig. 1). On the Lighthouse Plateau two distinct colonies named 'Old B' and 'New B' are recorded by Wodzicki and Robertson, 1953. These are here called Plateau Colony A and B respectively. Of the gannetries, the Main and the



I-IV GULL COLONIES. L.H. LIGHTHOUSE. A & B INSETS.  
 Fig. 1 — Location Map to show Black-backed Gull Colonies and the Cape Kidnapper's Gannetries. For details see text.

Black Reef colonies are part of the Sanctuary administered by the Cape Kidnapper Sanctuary Board. The Plateau colony is on private land just outside the Sanctuary. Four major colonies of the Black-backed Gull (*Larus dominicanus*) are known within a radius of 30 miles of the gannetries.

Some ornithologists hold that predation on colonies of nesting sea birds is a habit universally shown by the larger gull species. There is evidence that the Black-backed Gull in the Cape Kidnappers region preys on Gannet eggs, but this was not directly observed by the author during the four nesting seasons covered by this study.

In November 1956 a Black-backed Gull was observed taking the egg of a Gannet on the Lighthouse Plateau colony by Mr. A. Cochrane. Subsequently, Mr. R. Williams, the Sanctuary ranger, and Mr. C. F. Bundenberg observed the removal of an egg from the Main colony in October 1957, while predation was observed and photographed on the Black Reef colony by Taylor and Wodzicki, 1958. During the 1957/58 nesting season predation was frequently observed by the Sanctuary ranger and others on all three colonies, and it was suggested by Mr. R. Williams that predation could become a factor seriously affecting the Gannet population. As a result of this observation the ranger and the local Acclimatization Society shot 127 gulls during the 1958/59 nesting season. A further 27 gulls were destroyed in the 1959/60 season.

Between November 1959 and February 1963 the author made twenty-six visits of two to eight days' duration, to Cape Kidnappers and its environs, to observe the Black-backed Gull and Gannet colonies and obtain information on —

- (a) The number of Black-backed Gulls.
- (b) The number of gulls 'patrolling' the gannetries.
- (c) The nesting habits and the population trends of the Gannet.
- (d) The external circumstances and the prevalence of predation.

Further observations were made in periods of the author's absence during 1961 and 1962 by the Sanctuary ranger and others.

In recording the number of birds present in the Black-backed Gull population, a count was taken by field glasses of the birds present on the colonies. A record of the movement of birds to and from the colonies was made by the same method. The reaction of the Black-backed Gulls and the Gannets to the movements of tourists was also noted. In the study of the Gannet nesting habits both the Plateau gannetries were mapped. For the smaller colony each nest was recorded on a grid plan and a record of the nesting status was kept throughout the three seasons 1960-1963. The nest sites of colour banded birds of known age were recorded for the study of nest ownership and nesting success.

#### THE BLACK-BACKED GULL COLONIES

There are four major Black-backed Gull colonies within a radius of 30 miles from Cape Kidnappers. (Fig. 1).

- (a) Ahuriri Lagoon — "Beacons." 1,200 pairs (estimate).
- (b) Maraekakaho (Ngaruroro River). (No estimate).
- (c) Bare and Karamea Islands. 500 pairs (estimate).
- (d) Cape Kidnappers I-IV. 100 pairs (estimate).

- (i) On cliffs  $1\frac{1}{2}$  miles on Clifton side of Black Reef.
- (ii) On cliffs  $\frac{3}{4}$  mile on Clifton side of Black Reef.
- (iii) At beached cove near the tip of the Cape on the Northern side.
- (iv) Situated on headlands of a small bay  $1\frac{1}{2}$  miles south of the Cape. (N.B. This colony was recorded in the 1959/60 nesting season only and was probably a transitory nesting site with less than 10 pairs.)

Throughout the study all Black-backed Gull colonies have had more or less the same number of nesting pairs.

**TABLE 1 — Estimated Population of the Black-backed Gull on Kidnappers Colonies I - III**  
**Nesting Pairs**

	No. I	No. II	No. III	Total
18/11/59	4	39	6	49
29/12/59	47	41	11	99
17/11/60	28	42	8	78
21/1/61	35	11	—	46
4/2/61	30	8	—	38
29/8/61	16	—	—	16
14-15/12/61	47	46	6	99
8/1/62	39	38	9	86
25/8/62	45	23	No Count	68+
29/8/62	20	25	No Count	45+
6/10/62	25	30	5	60
17/12/62	33	42	No Count	75+

It was established early in this study that considerable movement of adult gulls takes place within a 15 mile radius of Cape Kidnappers.

- (a) A movement at dawn past Clifton, towards the main river mouths and Napier, and returning at dusk.
- (b) Movement mainly at the above times between gull colonies I and II and Black Reef, the Cape and Plateau localities, and vice versa.
- (c) Throughout the day, with no evident peak, southwards down the coast.

Within the immediate locale of the Main and Plateau Gannetries a more specific movement was noted. This took the form of a flight pattern which can be described as "patrolling." These flights, depending on the weather and the gulls' inclinations, were first noted on the Main Colony. The most frequent movement was east to west over the nesting area and pinnacles, at some height above the circling Gannets. During observations, gulls rarely came lower than this except to roost. This pattern was also prevalent at Black Reef.

Over the Plateau Gannetry the movement was above the circling Gannets, but low flights were more frequently observed.

In most cases gulls appeared from the northern end of the Plateau, flying parallel to the cliff, and up to 50 feet above the

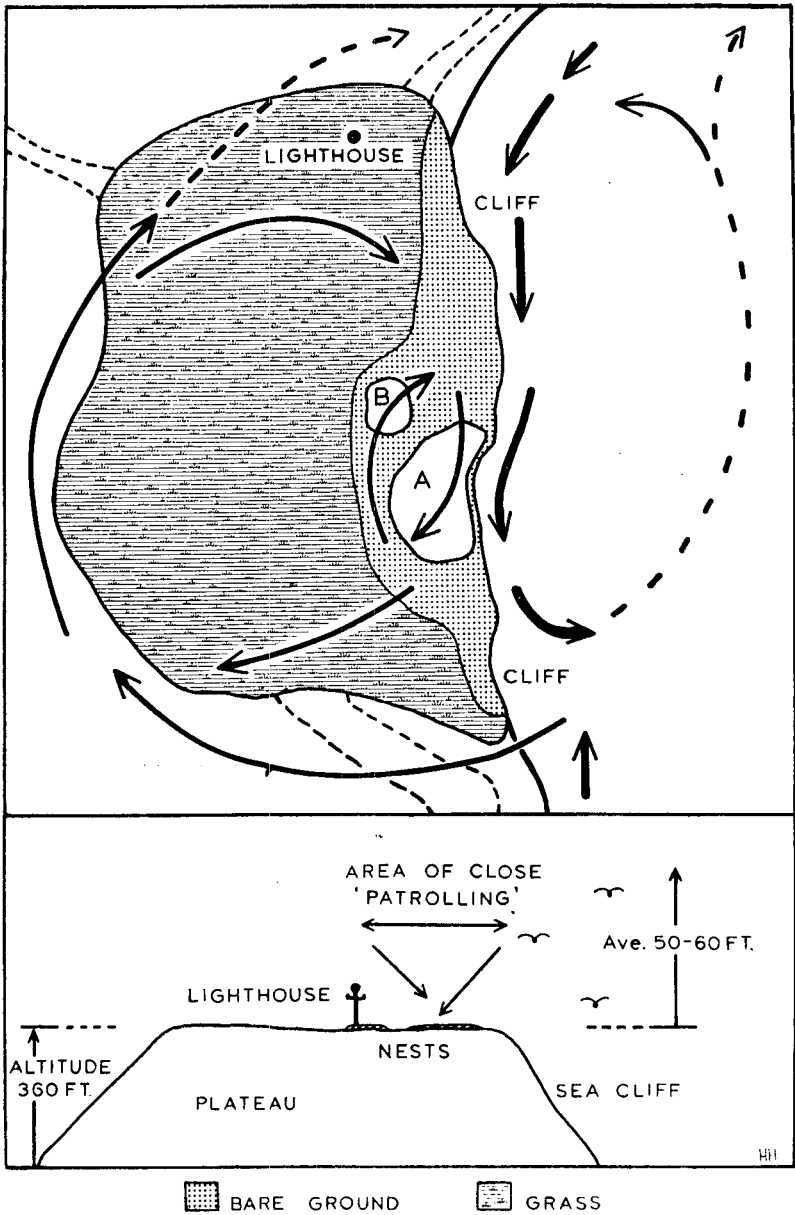


Fig. II — Pattern of Black-backed Gull "Patrolling" over the Plateau Gannetries.

level of the Plateau. On reaching the southern end, they would sweep down and out to sea or to the rear of the Plateau. They returned to the north, either to the Main Colony or for a further sweep over the Plateau Colonies.

The gull is an effortless glider and moves easily up, down and across wind, rarely using wing motivation except to steady flight or gain speed. During "patrolling" the beak is pointed towards the ground, as the bird scans the area below with sharp sweeping movements of the head.

The number of birds "patrolling" at any one time varied according to the time of the day. The most common grouping was that of one to two birds, though numbers of up to 20 were seen. "Patrolling" over the Plateau and Main Colonies was at a peak immediately after dawn and just before dusk. During the day occasional visits with no regular pattern were observed. However, it was noticeable on the Plateau Colony that "patrolling" tended to increase following observations by tourists and became very marked if the Gannets were disturbed.

Immature and juvenile gulls were rarely seen in the vicinity of the gannetries. Both D. Brathwaite and F. Kinsky (*pers. comm.*) suggest that these young birds move to some other part of the district until they are ready to breed. Whilst no predation by birds of this age group was personally observed it has been reported and, as common roosting areas are only 8-10 miles from Cape Kidnappers, it is possible for the young gulls to visit the gannetries regularly. Observations at Clifton show extensive movements north and south along the foreshore at dawn and dusk.

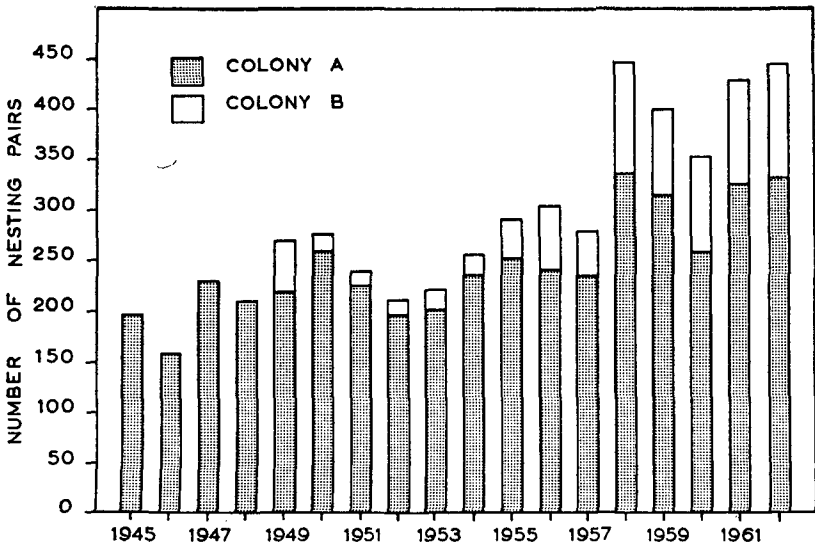


Fig. III — Pre-Christmas Counts of Nesting Pairs, 1945 - 62 at the Plateau Gannetry, Cape Kidnappers.

As a scavenger, the gulls' main incentive for "patrolling" the colonies is the number of Gannet regurgitations which are commonly found on a colony. It was very evident that the amount of regurgitated matter increased with disturbance by photographers or by fights in the colony.

According to Taylor and Wodzicki, 1958, a "patrolling" gull removed an egg from an unattended nest and carried it outside the nesting area to eat the contents. However, on the more isolated and often unattended nests on the outskirts of the colony the eggs were eaten at the nest. In all cases, the nest was unattended at time of predation.

The writer observed that following intensive "patrolling" a gull occasionally lands on the bare guano between Colonies A and B. A feature of this ground movement is the lack of interference or threat from "roosting" Gannets. However, on any approach to a nesting bird, signs of threat are shown by the Gannet. Mr. R. Williams reports predation on the colony margins, with the egg being taken from beneath the standing birds, during the greeting ceremony.

#### THE GANNET COLONIES

Since 1945 a regular count of nesting pairs of Gannets has been made in the week prior to Christmas (Wodzicki and Robertson, 1953, and Dr. K. Wodzicki, *pers. comm.*). While annual variation may occur, the pre-Christmas count represents 80-90% of the peak nesting population for a season. There are no pre-Christmas records for 1955, 1956, 1958, and 1960. Estimates have been made for these years from counts taken in November and January of the seasons concerned.

Between 1949 and 1952 a sub-colony (Plateau Colony B) appeared about 15 yards to the N.W. of Plateau Colony A (Wodzicki and Robertson, 1953). Because of its smaller size, nesting success was more easily recorded. As predation seems to be confined to eggs, nesting success has been considered only on the number of eggs hatched to chicks. The following terms, used here to describe the status of a nest, are defined:—

- (a) *Possible nest* = one showing signs of a mound, but with only intermittent indication of nest building or sitting.
- (b) *Empty nest* = showing evident signs of nest building and regular sitting, but containing no recorded egg.
- (c) *Known loss* = a nest recorded with an egg, but found to be empty at a later date.
- (d) *"Addled" egg* = eggs not hatched after 55-60 days. (Normal incubation period 43-46 days). This is a general term covering many factors affecting lack of development in the egg.

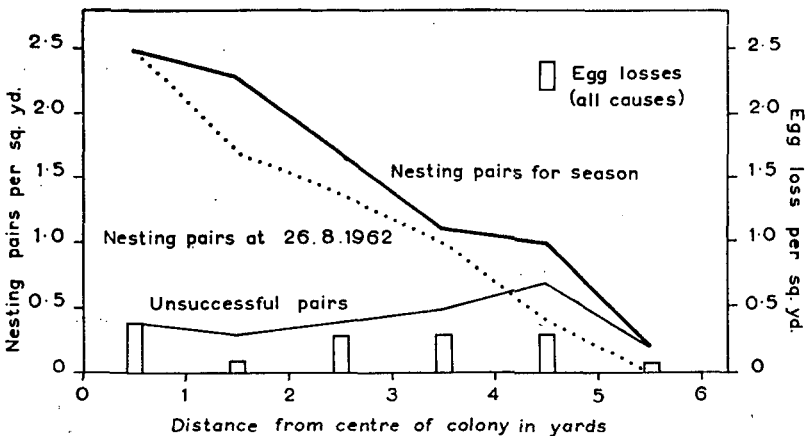
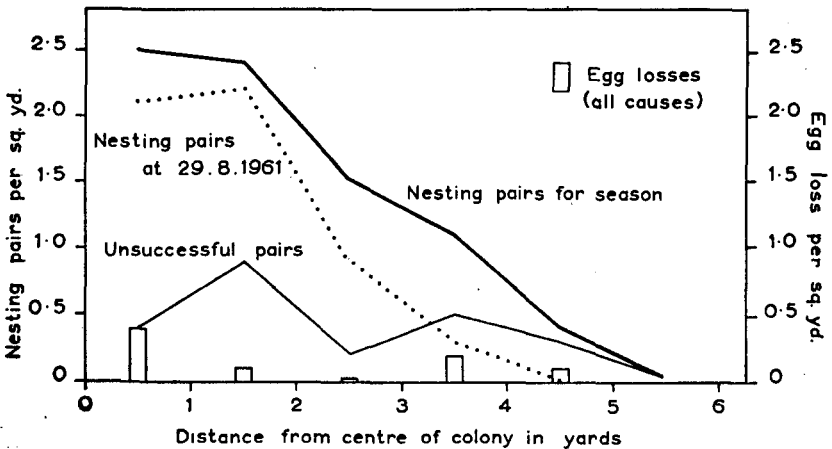
TABLE II — Percentage Analysis of Nesting Success  
Plateau Colony 'B' 1960-1963

Status	60/61	61/62	62/63
	%	%	%
Possible or Empty nests	23	19.45	23.5
Known Egg Loss	12	10.7	14.35
"Addled"	10 (Est.)	11.6	5.35
Chick Hatched	55	58.25	56.8
	100	100.00	100.00



When assessing the nesting success of a pair it can be shown that there is a definite correlation between the position in the colony of a nesting pair, the time of arrival at their nesting site, and the age of the birds.

Figures IVa and IVb show how nesting success decreases and known losses from all causes increase, the greater the distance from the central core of the nesting colony. *Note.* Figures IVa and IVb were calculated from nesting data obtained throughout the seasons concerned. The Nesting Pairs for Season data represent the maximum number of nesting pairs recorded during a season, while the counts taken in August were of birds showing definite signs of occupation and nest building. It will be observed that, while there is no evident increase in egg losses toward the margin of the colony, the number of



Figs. IV a and b — Relationship of Nesting Success to Position and Time of Arrival of Gannets on Plateau Colony B, Cape Kidnappers, 1961 and 1962.

chicks hatched declines with the reduction in density, and that on a proportion basis egg losses show an increase.

The age of birds, from chicks banded since 1951, shows a concentration of older birds in the centre of the colony.

Distance from centre of colony in yards			
0-2	2-3	3-5	5-6
11	11.8	8.6	6.4
Age of birds in years.			

### VISITORS

With the publicity that Cape Kidnappers has obtained during the past 12 years an increasing number of tourists has been visiting the gannetries. (An average of 3,500 per year during 1959-62.) The majority of visitors view the habits of the Gannet outside the Sanctuary, at the Plateau Colony, because of ease of access. Figure V illustrates the movement pattern of visitors. Quite apart from disturbance for photography and inspection of eggs and chicks, the presence of a large body of people is unsettling, especially to the birds nesting on the margin of a colony. While supervision will alleviate some of this problem much harm can be done by unsupervised parties.

These unsettling results of photography were seen on the Main Colony in the 1959/60 season. Any attempt to disturb the birds when most eggs were present was strongly resisted, and a quick return to the nest followed after disturbance. (Noted also by F. H. Robertson, December 1945). The same feature was noted on the "Lozenge Rock" at Black Reef (all available nesting positions occupied), where difficulty was encountered when an attempt was made to gain standing room inside the colony. On nearby "Chimney Rock," however, a colony not yet using all available space, the birds were more easily disturbed, especially on the margin of the colony. On the Plateau, birds on the margins of the colonies showed restlessness on the approach of visitors. The first birds to leave were roosting and unattached birds, followed by those with empty nests. Birds sitting on eggs showed signs of restlessness and threat on approach under 4 feet. If this occurred a few times in a short space of time, or throughout a day, the bird left the nest on subsequent occasions, becoming more easily disturbed as the day progressed. If disturbed off the nest to show eggs or chicks, the bird was more readily affected by the next group of visitors. The landward margins of Colony A and the complete perimeter of Colony B are prone to continual disturbance as these areas are the most accessible to visitors. This indicates that in an *expanding* colony, the birds are more likely to be disturbed even when sitting on eggs.

### DISCUSSION

It has been shown that the Black-backed Gull at Cape Kidnappers will take the eggs of the Gannet if a suitable situation is provided. It is doubtful whether it is a relatively new activity as gulls have frequented the gannetries since at least 1916.

Observations and published material indicate that three correlated factors must be considered when discussing the causes of predation.

- (a) The Gannet is a colonial bird dependent on both individual and mass defence to protect its eggs and young.

- (b) Young birds (usually those nesting for the first or second time) through the structure of the colony, nest predominantly on the outskirts of the mass of birds.
- (c) Disturbance by man, while photographing and observing the birds on the margin of the colony, creates situations suitable for predation.

With the soft nests of droppings and vegetable matter it may take 3-4 years for a permanent nest structure, capable of withstanding

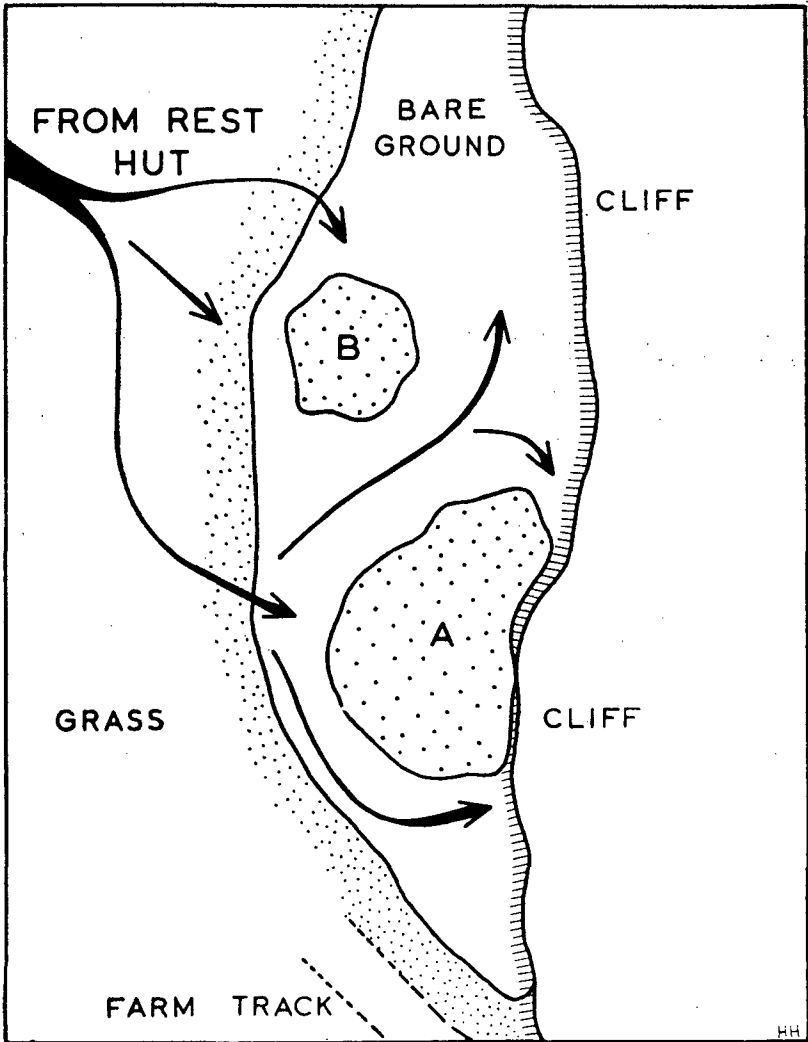


Fig. V — Movement Pattern of Tourists and Visitors at the Plateau Gannetries, Cape Kidnappers.

winter rain and stock trampling, to be built. Indications are that a core of at least 15-20 permanent nests and a population of from 40-50 pairs is necessary before a colony may start to increase in size.

While the margins of the colony may be populated by young or inexperienced birds, predation will increase if there is some vacant space where a gull may "parade" in search of regurgitations and await a suitable opportunity to take an egg.

On the outskirts of a colony this opportunity may arise during the greeting ceremony. The act of predation is greatly facilitated, however, if the bird is absent from its nest. If, in certain wind conditions, a bird is disturbed from its nest, a considerable period of time may elapse, even when visitors are no longer present. Also, a bird continually disturbed from its nest (by spaced parties of visitors or a large group — both of which are present over a long period of time) may remain absent for as much as 10 hours, as was observed in one case. This absence not only provides an opportunity for predation, but reduces the success of the egg through loss of incubation. It is evident also that disturbance by visitors is most marked on an expanding colony, for only in these colonies is there enough room for easy access and movement. Once the eggs are removed the sitting birds are not as constant in defence and are more easily disturbed. This increases the chances of the inner nests losing their eggs as they then become the nesting fringe of the colony.

While predation on the margins of colonies may be explained by nesting habits and disturbance, predation in the centre of a colony is not so definitely explicable. There is a number of possible reasons:—

- (a) The mate of the sitting bird may have died or been kept away by a storm.
- (b) The sitting bird may have been unable to feed for some days owing to weather conditions and have left the nest to do so.
- (c) Young and inexperienced birds may be nesting on a vacated mound.

The result however, is that the gull has a resting space from which to take eggs. Thus the centre of a colony may be robbed, though not to such an extent as the outer margins.

The population of the Plateau gannetries and other colonies within the Sanctuary has shown a steady increase irrespective of an estimated 10-15% egg loss from *all causes*. Black-backed Gull predation, though related to human disturbance, does not at present seem to be a serious menace to the nesting success of the Gannet on established Cape Kidnappers colonies. However, any situation which reduces the protective margin of young Gannets surrounding established birds, will render the colony prone to reduction.

#### SUMMARY

Four colonies of Black-backed Gulls (of which only the three main ones are considered extensively) exist in the close proximity of Cape Kidnappers. While gulls move extensively within the area, no large increase in numbers has been noted between 1959 and 1963.

Distinct gull movements, or "patrolling" have been observed near all gannetries at Cape Kidnappers. Mainly adult birds are concerned in this activity.

Edible matter, in particular regurgitations or eggs, may be taken by gulls from the Cape Kidnappers colonies, as elsewhere, if the opportunity occurs during "patrolling" movements in the air or "parading" on land.

The placing of Plateau Colony B on a grid has shown empty nests on the periphery.

It was found that the Gannets nesting in the centre of the colony had the highest percentage nesting success and returned earlier for the breeding season.

Banding has established that young pairs of Gannets arrive later at the gannetries, nest on the outer margins of the colony, and have smaller nesting mounds. This marginal area also coincides with the main areas of movement by tourists.

Figures from 1945-62 indicate a steady increase in the Gannet population of the Plateau Gannetries.

Because of publicity an increasing number of the public are visiting the Gannetries each year.

With gull populations at their present levels, there is no evidence that Black-backed Gull predation is having a depressing effect on Gannet numbers.

#### ACKNOWLEDGMENTS

Acknowledgments are due to the Chairman of the Cape Kidnapper Sanctuary Board for permission to visit the Sanctuary and camp in the rest hut; to the Internal Affairs Department and Mr. A. Cochrane for permission to study the Plateau Gannetries.

The author wishes to thank especially Dr. K. Wodzicki for his valuable assistance in field work, criticism and discussion throughout the period of study, as well as access to personal records and those of the Animal Ecology Division D.S.I.R.; Mr. R. Williams and the Junior Wildlife Wardens who willingly provided help with nest records in my absence, and discussion and information on past events; Dr. P. Ralph for critical reading of the manuscript; Mr. W. J. Scott and Mr. J. M. Reidy for permission to carry out field work; also to all those people and organisations both overseas and in New Zealand who have willingly provided literature, field notes and advice.

Grateful thanks to Dr. K. Westerskov and the Wildlife Branch, Internal Affairs Department, for their valuable technical assistance in the publication of this study as a Departmental Bulletin. Finally the author wishes to thank Miss H. Hall for her interpretation and drawing of the maps and diagrams.

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## SEA BIRDS FOUND DEAD IN NEW ZEALAND IN 1962

By B. W. BOESON

### ABSTRACT

Beach Patrols during 1962 covered a total distance of 731 miles and produced 1367 birds (55 species). Species are tabulated by month of occurrence and by the coastal zones in which they were found.

Unusual species include *Pygoscelis adeliae* (first record), *Pterodroma longirostris* (third record), *P. inexpectata*, *P. cooki*, *Procellaria cinerea*, *Puffinus pacificus* (first record), *Pelagodroma marina* and *Phoebastria palpebrata*. The number of storm killed petrels was considerably less than in 1961.

### INTRODUCTION

This account corrects and expands the brief interim report already published (Boeson 1963), and follows the report of 1961 in that dead birds are separated into 18 geographic zones that together cover the entire coastlines of the North and South Islands (see Map in Bull and Boeson, 1963).

Forty-one members took part in the year's work and sent in a total of 322 cards covering 731 miles of coastline. The cards record the finding of 1367 birds (55 species); a further 40 specimens were found on small islands.

There were no major "wrecks" during the year and this explains why the number of birds was so much smaller than in 1961. The year was brightened, however, by the finding of several species that are new or very rare in New Zealand (Falla 1962, and Kennington 1963).

### RESULTS

#### *Distribution of Patrols*

Table 1 shows the length of beach patrolled each month for each of the 13 zones covered. A five mile stretch of coastline at Awarua Bay in Fiordland was patrolled in February but no specimens were found; this is our first recorded patrol for the Fiordland zone. No patrols were reported from Hawkes Bay, Wairarapa, West Nelson or Westland. Patrols from The Brothers (North Coast South Island) are not included in Table 1 but the specimens are recorded in Tables 2 and 3. Wellington West Coast, Otago and North Canterbury were the only zones with patrols for every month of the year (Table 1). It is unfortunate that patrols from the Auckland West Coast total only 13 miles (spread over 5 months), because this zone appears to yield more birds per mile than any other.

#### *Kinds of Birds Found*

Species of penguins, albatrosses, petrels and shearwaters found in 1962 are shown on Table 2 which also records their monthly occurrence. *Puffinus griseus* (458) and *Pachyptila turtur* (225) were the most abundant species and *Eudyptula minor* (107) appeared in third place. Rare or new species found were; *Pygoscelis adeliae* (first record, see Kennington 1963), *Pterodroma longirostris* (third record, see Falla 1962), *P. inexpectata*, *P. cooki*, *Procellaria cinerea*, *P. westlandica*, *Puffinus pacificus* (first record, see Falla 1962), *Pelagodroma marina* and *Phoebastria palpebrata*. It is interesting that the two specimens of

TABLE 1: Miles Patrolled and Birds Found on Different Coasts

Coastline	Code No.	Code Letters	Number of Miles Patrolled Each Month — January - December												Total Miles	Total Birds	† Birds Per Mile	
			J	F	M	A	M	J	J	A	S	O	N	D				
North Cape	1	NC	1						6	2	2	1				12	19	1.6
Auckland East	2	AE	10	1	*	2						2				17	61	3.6
Bay of Plenty	3	BP	18	6	9	16	5	3	3			*				61	68	1.1
East Cape	4	EC	3	3	6	3		3	3			3				33	4	0.1
Wellington South	7	WS		13	2	2						1				24	7	0.3
North Canterbury	8	CN	17	6	16	9	10	14	7	4	7	11				117	207	1.8
South Canterbury	9	CS	1	1	1	3		*				3				9	22	2.4
Otago	10	O	7	9	12	21	7	12	5	2	6	1				98	64	0.7
Auckland West	11	AW				1	1	3	2			3				13	137	10.5
Taranaki	12	T										4				20	29	1.5
Wellington West	13	WW	15	20	18	27	69	33	7	39	35	12	16			300	672	2.2
North Coast, South Is.	14	NCS	2	4	4				4	5						19	9	0.5
Southland	18	S							3	3		2				8	68	8.5
Total Miles	---	---	72	47	78	81	101	68	25	63	56	34	61	45		731	-	-
Total Birds	---	---	142	117	81	56	125	37	16	66	128	52	239	308		1367		
Birds per Mile	---	---	2.0	2.5	1.0	0.7	1.2	0.5	0.6	1.1	2.3	1.5	3.9	6.8				1.9

\* Indicates months with patrols totalling less than  $\frac{1}{2}$  mile; all other values are to the nearest mile.

† The table is based on a total of 1367 birds; a further 40 birds were excluded from the table (see text).

TABLE 2: List of Species Found Each Month

Months Birds Found:	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total Specimens
Species of Birds													
<i>Megadyptes-antipodes</i>			3	4	2								9
<i>Pygoscelis adeliae</i>												1	1
<i>Eudyptula minor</i>	17	5	7	9	32	8	3	3	5	3	10	8	107
<i>E. albosignata</i>	3	5	7	1					1		2		19
<i>Diomedea exulans</i>		1											1
<i>D. epomophora</i>												1	1
<i>D. chrysostroma</i>						1	1						2
<i>D. bulleri</i>						1							1
<i>D. cauta</i>	1	1		1	2								5
<i>Phoebastria palpebrata</i>								2			2	1	8
<i>Diomedea species*</i>						1							2
<i>Macronectes giganteus</i>	1			1		2		2		1	1	1	11
<i>Daption capensis</i>									2	1	1		3
<i>Pachyptila vittata</i> subsp.	1	1				1	1	1	14	1	1		20
<i>P. salvini</i>									22				24
<i>P. desolata</i>						1	1		2				2
<i>P. d. banksi</i>									3				3
<i>P. belcheri</i>								2	5				8
<i>P. turtur</i>	44	63	7	6	24	6	6	7	22	10	19	11	225
<i>Pachyptila species*</i>	3	19	12	7	3	1		7	24	7	8	8	92



TABLE 2 (Continued)

Months Birds Found:	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total Specimens
<i>Puffinus carneipes</i>					3	1						7	14
<i>P. pacificus</i>	1						1						2
<i>P. bulleri</i>	5												20
<i>P. griseus</i>	11				2			2		3	1		458
<i>P. tenuirostris</i>	1	1		5	25	1	1			8	163	230	
<i>P. gavia gavia</i>	12	2	4	6	1	2				4	6	2	16
<i>P. gavia huttoni</i>	7	5	2	10	10	2				2	4	4	42
<i>P. assimilis</i>		1								3	3		24
<i>Procellaria cinerea</i>	1												1
<i>P. westlandica</i>		1	1					1					1
<i>Pterodroma macroptera</i>	3				1	1							3
<i>P. lessoni</i>		1											6
<i>P. inexpectata</i>					2							1	3
<i>P. longirostris</i>							1	1			2	3	8
<i>P. pycrofti</i>	2										2	1	5
<i>P. cooki</i>													2
<i>Pelagodroma marina</i>	2												1
<i>Pelecanoides urinatrix</i>	3										1		1
Miscellaneous species†	4						1	2	4	1	5	6	4
	25	28	25	16	22	14	4	45	21	8	13	10	27
<b>TOTALS:</b>	150	134	82	57	131	44	16	66	128	52	239	308	1407

\* Too fragmentary to allow specific identification.

† Other than petrels or penguins.

TABLE 3: List of Species Found on Different Coasts (Zones)

Index No. of Zone†	1	2	3	4	7	8	9	10	11	12	13	14	18	Total Birds
Index Letters of Zone	NC	AE	BP	EC	WS	CN	CS	O	AW	T	WW	NCS	S	
Species of Birds														
<i>Megadyptes antipodes</i> ----						3	2	4						9
<i>Pygoscelis adeliae</i> ----						1								1
<i>Eudyptula minor</i> ----	2	3	20			6		2	7	5	60	1	1	107
<i>E. albosignata</i> ----						14		5						19
<i>Diomedea exulans</i> ----											1			1
<i>D. epomophora</i> ----											1			1
<i>D. chrysostoma</i> ----			1								1			2
<i>D. bulleri</i> ----									1					1
<i>D. cauta</i> ----				1		4		2			1			8
<i>Phoebastria palpebrata</i> ----	2													2
<i>Diomedea species*</i> ----					1									1
<i>Macronectes giganteus</i> ----	2					1		1	1		3	1		9
<i>Daption capensis</i> ----											3			3
<i>Pachyptila vittata</i> subsp. ----						2					17		1	20
<i>P. salvini</i> ----									2		22			24
<i>P. desolata</i> ----											2			2
<i>P.d. banksi</i> ----											3			3
<i>P. belcheri</i> ----	1										7			8
<i>P. turtur</i> ----		3			3	2			4	2	203	8		225
<i>Pachyptila species*</i> ----			1			1		2			88			92

TABLE 3 (Continued)

Index No. of Zone†	1	2	3	4	7	8	9	10	11	12	13	14	18	Total Birds
Index Letters of Zone	NC	AE	BP	EC	WS	CN	CS	O	AW	T	WW	NCS	S	
<i>Puffinus carneipes</i> ----		11	3											14
<i>P. pacificus</i> ----											2			2
<i>P. bulleri</i> ----		5		1					2		12			20
<i>P. griseus</i> ----	5	16	19		2	95	14	10	109	15	166	5	2	458
<i>P. tenuirostris</i> ----	1					10	1		1		3			16
<i>P. gavia gavia</i> ----	2	6	3	1		10	1				12	6		42
<i>P. gavia huttoni</i> ----						21					3			24
<i>P. assimilis</i> ----											1			1
<i>Procellaria cinerea</i> ----			1											1
<i>P. westlandica</i> ----						1					2			3
<i>Pterodroma macroptera</i> ----		1	4						1					6
<i>P. lessoni</i> ----		1		1					2		4			8
<i>P. inexpectata</i> ----											5			5
<i>P. longirostris</i> ----			2											2
<i>P. pycrofti</i> ----		1												1
<i>P. cooki</i> ----		2							1				1	4
<i>Pelagodroma marina</i> ----		1	3											4
<i>Pelecanoides urinatrix</i> ----	3	7	3			1			1		10		2	27
Miscellaneous species‡	1	4	8		1	35	4	38	4	7	40	27	62	231
<b>TOTALS</b> ----	<b>19</b>	<b>61</b>	<b>68</b>	<b>4</b>	<b>7</b>	<b>207</b>	<b>22</b>	<b>64</b>	<b>137</b>	<b>29</b>	<b>672</b>	<b>49</b>	<b>68</b>	<b>1407</b>

\* Too fragmentary to allow specific identification.

† Other than petrels or penguins.

‡ See Table 1.

*P. pacificus* were of different colour phases, a light phased bird in January and a dark one in June.

"Miscellaneous species" consisted of the following; *Sula bassana* (19), *Phalacrocorax carbo* (3), *P. varius* (6), *P. chalconotus* (1), *P. punctatus* (18), *Larus dominicanus* (94), *L. novaehollandiae* (39), *L. bulleri* (8), *Sterna striata* (28), *Falco novaeseelandiae* (1), *Circus approximans* (3), *Himantopus leucocephalus* (2), *Turdus ericetorum* (1), *Passer domesticus* (5), *Emberiza cirrus* (1), *Chloris chloris* (1), and *Halcyon sanctus* (1). The harriers and the falcon were shot on The Brothers Islands, the house sparrows and the girl bunting were found on these Islands, too.

#### Seasonal Distribution

The usual Autumn-early Winter decline in birds per mile is reflected in Table 1. The rather high figures of 6.8 birds per mile in December is caused by an increase of *Puffinus griseus*. November was influenced to a lesser degree by the same increase of this species.

Unlike the 1961 Report (Bull and Boeson, 1963) severe "wrecks" were absent in 1962. In fact, 1962, could stand as a rather successful year for the birds — not for patrollers!

#### Differences Between Zones

Table 3 shows the zones in which the various species were found. The numerical importance of certain species differs greatly from one zone to the other. The mean number of birds found per mile on the Wellington West coast during 1962 (2.2) was much greater than on the Otago coast (0.7) and the North Canterbury coast (1.8) even though these zones were patrolled regularly during the year (Table 1). As in 1961 (Bull and Boeson, 1963) these differences are probably to be explained by the aspect of the coast in relation to prevailing winds.

#### Discussion

The mean number of birds found per mile in 1962 (1.9) is only about half that of the previous year (3.7). This doubtless explains the drop of 126 miles in the length of beach patrolled in 1962; the same enthusiasm can not be expected if results from long patrols are consistently disappointing. The year 1961, with its several wrecks, was an unusually exciting year for beach patrollers and it is encouraging that, though many fewer birds came ashore in 1962, the number of people taking part in the scheme has remained consistent at 41 and that they managed to cover 731 miles of beach.

If we are to understand the factors controlling the varying degree of mortality in sea birds it is essential that patrols be carried out regularly and not at times when people expect to find a lot of birds. It cannot be stressed too strongly that "nil" beach patrols are just as important as the others.

#### ACKNOWLEDGEMENTS

Thanks are due to the following members who took part in this year's patrols: J. A. Bartle, Mrs. M. L. Barlow, J. W. Bain, P. C. Bull, P. Bond, D. Brathwaite, B. W. Boeson, D. E. Crockett, C. N. Challies, C. G. Cathie, J. Clearwater, V. T. Davis, M. Day, D. G. Dawson, M. Davis, J. C. Davenport, A. T. Edgar, J. Ewen, B. M. Fitzgerald, M. Hodgkins, P. C. Harper, M. J. Imber, J. R. Jackson, S. R. Kennington, N. J.

Ledgard, Mrs. M. McGrath, D. McGrath, W. Marsden, H. R. McKenzie, Mrs. R. V. McLintock, M. G. Macdonald, R. J. Nilsson, W. T. Poppelwell, R. Smart, P. D. G. Skegg, R. B. Sibson, Mrs. I. G. Urquhart, A. Wright, R. R. Wiblin, R. W. Wheeler and M. J. Williams.

Finally, I am extremely grateful to Mr. P. C. Bull for his co-operation and help at all times and especially for reading the manuscript and making helpful suggestions.

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## SHORT NOTES

### BLACK-FRONTED TERN ON THE HAAST COAST

Judged by the paucity of reports, the Black-fronted Tern (*C. albostratus*) is a rare bird west of the Southern Alps and on the coast of Westland. Several ornithologists have visited that region without finding this tern at all, though the Black-billed Gull (*L. bulleri*) is common enough; and rivers such as the Taramakau and Whataroa have wide areas of shingle which would seem to offer suitable sites for nesting. Perhaps the heavy rainfall is the deterrent.

The following record is therefore of some interest. On 20/2/63 my wife and I found two Black-fronted Terns resting on a sandbar at the joint mouth of the Turnbull and Okuru Rivers, about five miles south of Haast. Both were adults in worn breeding dress. They were loosely attached to a flock of eleven White-fronted Terns (*S. striata*). Mr. P. Grant (*Notornis* X, 185), who found a single Black-fronted Tern at the Taramakau estuary, has commented on the rarity of this species in Westland. By contrast the White-fronted Tern is plentiful and has breeding colonies at many estuaries.

— H. R. MCKENZIE



### BROAD-BILLED SANDPIPER IN MANUKAU HARBOUR

The purpose of this note is to record the second example of the Broad-billed Sandpiper (*Limicola falcinellus*) to be discovered in New Zealand. The first was known to be present in the Firth of Thames from January to March, 1960 (*Notornis* VIII, 233-235). It was skilfully photographed by Donald Urquhart; and it is a matter of some interest that as the result of a request from the editors of *British Birds*, two of his photographs appeared in that magazine (Vol. 54, plates 52 b and c).

On 1/12/63 John Jenkins and I reached the Karaka Coast of Manukau Harbour via Kidd's paddocks. At midday the tide was nearly full; but the weather was showery, and as a drifting curtain of drizzle was moving steadily in our direction, we ate our lunch without being in any hurry to examine more closely a flock of small waders, mostly summering Wrybills, which occupied the top of a little beach scarcely

two chains from the patch of gorse where we were sheltering. After the weather cleared, I walked slowly across to study these waders more closely, approaching behind an upturned dinghy stranded in the bay during a recent gale and now resting at the top of the beach. Most of the flock were within a few yards of it. There were more birds than at first appeared, as at least half of the flock were squatting in hollows in the soft sand and shell.

Four Turnstones and a Red-breasted Dotterel received only a passing glance. The tally of Wrybills was 34, and I was checking the six Red-necked Stints, which were elusively scattered among the Wrybills when a very small short-legged sandpiper rose slowly from one of the hollows and took a few steps. It had a long, rather heavy bill which dipped distinctly near the tip; and as it was only fifteen yards away, I recognised it at once as a Broad-billed Sandpiper. Only a few moments were needed to check that its crown was streaked and its legs dull green. My impression was that it was rather more heavily spotted on the sides of the breast than the Firth of Thames specimen when first seen in January 1960. J.J. was hastily recalled from the pursuit of other waders and we were able to compare notes together. During our examination of the bird, it moved slowly down from the beach and started to feed on the wet ooze with a Wrybill on one side and a Red-necked Stint on the other. A broad-brimmed sunhat would have covered the three. We could not have had a handier set of circumstances for judging its size, shape and markings, which together make *falcinellus* quite distinct from other small sandpipers.

— R. B. SIBSON

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#### NOTE ON THE LITTLE BITTERN

If the careful descriptions of a small bittern seen at Meremere by P. J. Howard and others (*Notornis* X, 317-319) are translated into a composite sketch the bird seems unlikely on several counts to be the New Zealand Little Bittern (*Ixobrychus novaeseelandiae*). Most of the features described add up to a small, and probably young, specimen of the Brown Bittern (*Botaurus poiciloptilus*) and the description of behaviour and attitudes does nothing to discount this suggestion. Many immature specimens of the Brown Bittern in collections are much smaller than adults, with remarkably short bills. The editorial note quoting an earlier observation by R. T. Adams suggests in fact that Mr. Adams' first conclusion that the bird he saw was an unusually small specimen of Brown Bittern was correct. The Meremere bird is described in two places as having 'an elongated dumbbell-like face patch.' This is diagnostic of *Botaurus*, as also is the wing description 'wings buff, barred with brown, somewhat resembling hen pheasant. Scapulars buff, barred with grey.'

*Ixobrychus* is not barred anywhere, at any age. Its flight feathers and tail are jet black, contrasting in flight with the greater wing-coverts which are chestnut-buff. Cheeks above the whitish throat are uniformly chestnut and this colour continues down the neck, becoming dark vinous where the long neck feathers meet at the back. The crown is black and back dark rich brown. There is a generous amount of dark centring in some feathers, more pronounced in young birds, but the pattern thus produced is longitudinally streaky. It is, moreover, a very small bird, of body size, except when the neck is stretched, not larger than a California Quail.

The status of the New Zealand Little Bittern as a breeding bird has apparently never been established. Its distribution on the evidence of the dozen specimens preserved in New Zealand museums, and one or two abroad, appears to have been restricted to Westland and the Cold Lakes. Unless the specimen can be traced there is not much warrant for accepting the Tauranga record of a bird said by Buller to have been given by Mair to Colenso who was reported to have sent it to the Linnean Society. It is not clear from the record at what point, and by whom, it was identified.

Taxonomically the local form seems reasonably distinct and, as advocated by Oliver (*New Zealand Birds*, 2nd ed. 1955) is better treated binomially (as *novaezelandiae*) until the species of *Ixobrychus* are properly reviewed. New Zealand birds, by a slight margin over *I. sinensis* are the largest in the genus. If the existing specimens are really representative of all ages and both sexes they also lack the marked sexual dimorphism which produces a distinctive contrasty male plumage in all other species. In wing formula and extent of feathering on the tibia, *novaezelandiae* differs from *I. minutus* the distribution of whose several races is generally given as Europe, Africa, Western and Central Asia and parts of Australia. The New Zealand series has some of the plumage features characteristic of *I. exilis* of the Americas, and has even more in common with the average female plumage of *I. sinensis*, a species credited with a wide distribution, centred in South-East Asia but extending to the Seychelles, Northern Australia, and Micronesia. Sharpe (*Cat. Birds Brit. Mus.* XXVI, p. 229, 1898) has already noted that specimens from the extreme south-east of the known range of *sinensis* tend to be much darker and richer in plumage. What remains to be determined is whether New Zealand material represents extra-limital vagrants from some such stock in the Western Pacific, or derivative breeding stock. On available evidence the latter seems likely, but do they still survive?

— R. A. FALLA



#### CASPIAN TERNS IN THE LOWER WAIKATO

In New Zealand the Caspian Tern (*H. caspia*) feeds mainly in shallow water along the coast and in tidal estuaries. Only on the Volcanic Plateau at about 1000 ft. a.s.l. is it known regularly to frequent freshwater lakes well inland. At Rotorua a few pairs may attempt to breed in Sulphur Bay; and outside the nesting season a few dozen may gather at dusk to roost on Silica Flats.

There is one other district in the north where Caspian Terns penetrate well inland, namely the lower Waikato. The river is just tidal as far as Mercer, some twenty miles from the sea; but travellers beside the river need not be surprised if they see these large conspicuous terns as far as Ngaruawahia. For example on 21/1/63 ten were resting on a sandbank at Meremere.

A special feature of the lower Waikato is the group of shallow lakes on either side of the river between Te Kauwhata and Taupiri. In mid-September 1963, H. R. McKenzie and I spent part of three days investigating these lakes. On the afternoon of 12 September we counted 21 Caspian Terns fishing over the choppy waters of Waikare, the largest of the lakes. The weather was overcast and blustery. Some of the terns were over the centre and along the lee-shore, but most were fishing

the more sheltered willow-fringed bays on the windward side. Because of the size of the lake, our count was certainly short of the full number.

We left Waikare about 3.30 p.m. and made for Lakes Hakanoa and Kimihia, five miles further south near Huntly. Hakanoa produced no Caspian Terns. Kimihia has been drained and is now an open-cast coalmine. But here at 4.30 p.m. on part of the former lake-bed, now a watery flat, 22 Caspian Terns had already come into roost. An examination of their heads showed that most of them were immature, but a few had the black crowns of adults. The marshy remnant of L. Kimihia would certainly not provide a feeding ground for these birds and we considered that this flock was probably composed of birds which had been fishing the Huntly-Taupiri stretch of the river. Evidently some Caspian Terns which feed by day over these lakes return to the coast at dusk, for later that evening we saw two high over Glen Murray heading apparently for the estuary on a roosting flight. The next day we found two Caspian Terns fishing Lake Wahi, but none was seen on three visits to Lake Whangape, where a plunging Caspian Tern would have to be careful to miss the shags and Black Swans.

Unless there is an unlocated breeding colony on one of these lakes, most of the Caspian Terns seen inland at this season in the lower Waikato must be immature non-breeders. According to David Walter, there is a breeding colony of about 25 pairs on the sandy island which now almost blocks the mouth of the Waikato river. On 23/6/63 when I visited the sands at Port Waikato, not far from the nesting island, I counted 45 sitting together and nearly all had the full glossy black caps of adults, even though mid-winter was only just past. It does not seem likely that adults which had recently returned to the vicinity of a breeding ground at the start of a new nesting season would be foraging 30-50 miles inland when they had a large estuary providing an abundant food supply right beside them.

Another question which suggests itself is, "Do Caspian Terns use the Waikato as a migration route?" Banding has already shown that within a few months of leaving the nest Caspian Terns reared on Palliser Spit may reach Manukau Harbour, a few miles north of the Waikato estuary. Do they follow the coast or do they travel overland at least for part of the way? Any observations of Caspian Terns along the Waikato above Hamilton, over hydro-electric dams such as Karapiro, Arapuni and Whakamaru and at Taupo may eventually contribute to the solution of this problem. At the southern end of the North Island how far do Caspian Terns penetrate the rivers which flow from the central highlands?

— R. B. SIBSON



#### ANALYSIS OF A BLACKBIRD'S NEST

In September 1960 the nest of a Blackbird (*T. merula*), completed but not yet used, was blown down in a high wind. The outside dimensions were 6 inches broad by 5 inches deep; the egg chamber inside measured 4 inches one way and  $3\frac{1}{2}$  inches the other, and was  $2\frac{3}{4}$  inches deep; the nest consisted of an outer layer, a middle layer compacted with mud and wet leaf mould, and an egg chamber separable without much difficulty from the compacted middle layer. The nest was taken to pieces as carefully as possible to avoid breaking any of its component parts, which were as follows:—



	Base and outer layer	Mid layer and rim	Egg chamber	Total
Strips of bark ----	25	5		30
Smaller bark fragments ----		117	6	123
Fern stalks and fibrous material	13	49		62
Pieces of dry fern ----	7	26		33
Green fern tips ----	2	3		5
Small twig ----			1	1
Dry leaves ----	17	23	7	47
Skeleton leaves ----	9	16	57	82
Green beech leaves ----	2			2
Grass and fine material ----		1602	2003	3605
		<hr/> 1841	<hr/> 2074	<hr/> 3990

Having counted the components as above, I was left with about a quarter of a tea cup full of short pieces of dry grass or fibre under one inch long; some of this residue may have been broken during dismantling, but much of it had I think been nipped by the bird during building.

The strips of bark were  $\frac{1}{8}$  to  $\frac{1}{2}$  inch wide and from 4 to 7 inches long; in the mid layer three longer strips were used, 9,  $9\frac{1}{2}$  and  $11\frac{1}{2}$  inches. Most of the fine material used in the mid layer and egg chamber varied from  $1\frac{1}{2}$  inches to 6 inches in length, one piece of grass 18 inches long. In the mud layer there was some partly disintegrated material (fragments of skeleton leaves, etc.) which were not included in the count.

— A. T. EDGAR

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#### A LOCAL NAME FOR THE TOM-TIT

Mr. D. G. Medway informs me that near Whangamomona in eastern Taranaki the settlers know the Tom-tit (*P. toitoi*) as the Butcher Bird, the name being derived from the fact that the white breast of the male resembles the white apron worn by butchers. In the Old World the shrikes are sometimes known as butcher birds and the name is bestowed for a very different reason.

There may be other local names for birds which are worth recording as part of New Zealand folklore and linguistic usage.

— R. B. SIBSON

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## REVIEW

*Birds of the Atlantic Islands*, Vol. I, by D. A. Bannerman. Oliver & Boyd, 84/-.

This handsome volume is concerned with the history of the birds of the Canary Islands and the Salvages. These islands have long attracted European naturalists and the list of visitors includes many names famous in British ornithology. Since his first visit which took place more than half a century ago, the author has made the ornithology of the Atlantic Islands one of his special studies. In the course of his travels among these islands he has shared in many original discoveries. The insular race of the Cream-coloured Courser bears his name. As might be expected, he writes with authority, understanding and sensitivity.

The Canary Islands form a mountainous archipelago, some 350 miles in length, lying roughly east and west, for the most part between lat. 28° N and 30° N. There are well-marked insular forms of many familiar European birds. The isolated Salvages in lat. 30° N are famed for the numbers of petrels and shearwaters which come ashore to breed. New Zealand ornithologists will find the accounts of these *tubinares* especially interesting.

The Frigate or White-faced Storm Petrel (*P. marina*) for which the Spanish name is El bailarino (the dancer) — Skipjack is the New Zealand equivalent, is represented by the race *hypoleuca*. The author hardly does justice to the status of our commonest storm-petrel with his remark that "another race inhabits the Chatham Islands." The breeding race of the Little Shearwater (*P. assimilis*) is *baroli*. As in New Zealand it is basically a winter-breeder, but with an extended season of burrow-visiting and egg-laying. Incidentally the odd *assimilis* has now been discovered coming ashore on Big Chicken in the third week of December among typical summer-breeders. Cory's Shearwater (*P. diomedea borealis*) which figures on the New Zealand list on the strength of a single waif is "by far the most numerous shearwater" around the Canaries. Its numbers are being thinned by 'mutton-birding.' In the Salvage Islands this large shearwater "constitutes the chief wealth of these uninhabited rocky islets." May one ask on what ground it appears as *diomeadia* instead of *diomedea*?

The colour plates are superb. Here we may see G. E. Lodge painting storm petrels as they should be painted. Most of the plates are by D. M. Reid-Henry upon whom surely the mantle of Lodge has been cast. His birds are most attractively depicted in their natural setting, a luminous landscape or sea-scape, whether they are desert birds among the rocks and cacti or passerines in the tamarisks, or chough, swifts and falcons against a background of coastal cliffs. We may linger lovingly, too, near the painting of that exciting species, the Blue Chaffinch. Is there not a large empty ecological niche in New Zealand waiting to be filled by some realistic painter of birds? The author is indeed lucky in his illustrators. For his black-and-whites he has been able to call upon not only Lodge and Reid-Henry but also Gronvold and Roland Green. The sketches are excellent whether of chats or waders; and they enrich a long section devoted to the many regular migrants and stragglers.

After his notable series of spacious volumes on the birds of West Africa, the British Isles and Cyprus, ornithologists have come to expect something in the grand manner from Dr. Bannerman. This recent volume will not disappoint them. Its companion volume, which will deal with the birds of Madeira, the Desertas and the Azores, is eagerly awaited.

— R. B. S.

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## PERSONALIUUM

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Members will have been pleased to note in the New Year Honours list the award of O.B.E. to Dr. Charles A. Fleming, in recognition of his service to science in New Zealand, and to the Royal Society of New Zealand in particular. Dr. Fleming's services to ornithology and to the founding and development of the O.S.N.Z. are well known, and we congratulate him on his award.