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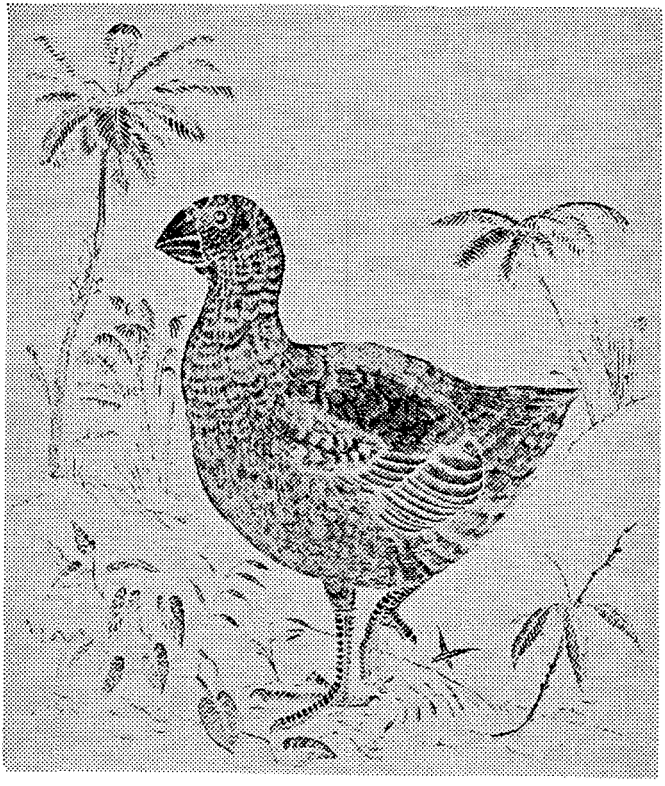
Notornis

In continuation of New Zealand Bird Notes.



Bulletin of the Ornithological Society of New Zealand.
Published Quarterly.

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CONTENTS.

CLASSIFIED NOTES will appear in the January issue; contributions should be in the hands of the Editor not later than October 15.

STUDY OF BLACK-BILLED GULL.—Mr. Elliot Dawson, of the *Zoology Department, Canterbury University College, Christchurch,* is making a study of the black-billed gull. He would appreciate the co-operation of members in order to get information on its distribution, breeding, numbers, etc., and would like to obtain reports from all parts of New Zealand where it occurs.

NOTES ON PARENGARENGA HARBOUR WADERS.

By E. G. Turbott, Auckland Museum.

The writer first spent a day on Parengarenga Harbour during the Auckland Museum expedition to the coastal islands on February 22, 1934. More recently two holidays with Mr. and Mrs. A. H. Watt, at Paua, during February, 1947, and 1950, gave the opportunity to gain more experience of the birds of this richly populated tidal harbour; and these visits were followed by two shorter trips in February and March, 1951. The present account is intended to record observations on these visits. Two noteworthy species recorded are sanderling and grey-tailed tattler, the latter being the first field record of the bird in New Zealand.

Much of the discussion refers to local information for which the writer expresses his debt to A. H. Watt, whose knowledge of the harbour and its waders extends over the 35 years of his residence at Te Kao and later at Paua. A number of his observations are included in addition to those published in his own notes. Kaka Wiki, of Te Kao, has helped with useful information on the godwit.

The last visit mentioned was made in the company of H. R. McKenzie, D. A. Urquhart and A. H. Watt, and appreciation is expressed for the opportunity to include additional observations indicated under their initials.

SOME GEOGRAPHICAL NOTES.

The traveller to the north, after passing up the long northern isthmus, looks down from the low hills north of Te Kao upon the harbour's sprawling tidal channels spread in a gleaming pattern of water and bare flats. The winding channels penetrate deeply into the surrounding clay hills almost to the dunes behind Ninety Mile Beach. To the east a line of dazzling white sand stretches northwards some four miles to the entrance, dividing the pale waters of the Te Kao channel from the ocean.

The vivid gumland scrub has changed little since T. F. Cheeseman's account was written in 1895. The low manuka, flowering as it does for most of the year, springs up with perhaps a little less tenacity after each of the spasmodic although long-continued attempts to burn off for rough pasture. Te Kao lies surrounded by pasture land in the valley at the southern tip of the harbour and Te Hapua and its outlying farms occupy the points between north and west arms.

The peninsula, which was the site of the former settlement of Paua (or wrongly "Parenga"), extends into the centre of the harbour. Its terminal point, known as Te Pua, is directly opposite the white dunes of the south head across the narrow southern channel. Paua, where most of the observations were made during the above visits, is thus exceptionally placed for watching the tidal movement of waders and their feeding and resting habits on the central portion of the harbour. The land reaches no great height to west and south, but northern and north-western channels of the harbour penetrate the comparatively high northern block which rises to the strongly outlined summits of Kohuronaki (1008ft.) and Unuwhao (1063ft.). This hilly region is continuous to the prominent headland forming the north point of the entrance. North of the entrance the coast continues with the same rugged outline for eight miles to North Cape, descending before the cape to the extensive flats behind Waikuku Beach.

The harbour is about 15,000 acres in area; and within the heads the three main arms branch off—the northern (Poroporo), western (Waitiki) and southern arms, the last dividing again into two (Kauanga and Te Kao). Each arm again divides towards the head. Even close to the entrance the water is shallow, except for a fairly deep main passage. Within the arms each central channel shrinks to little more than a narrow ditch at low tide. The harbour might be compared to a system of river estuaries, and in shape and topography it is such that the greatest possible area of mudflat is exposed.

At least towards the lower reaches, the flats are fairly level and consist of bare mud or boggy **Zostera** beds. There appears to be a considerable proportion of sand throughout, and this is an especially noticeable characteristic of the mudflats round Te Pua peninsula, directly opposite the heads.

The main feeding grounds for waders would appear to be the lower reaches rather than the narrow ribbons of mud towards the head of the arms, which tend to grow beds of mangroves. These range from low thickets over much of the Te Kao region to tall forest which grows in the Poroporo arm, and have the effect of greatly reducing the number of high tide rests within the harbour, which as far as is known are restricted to the Te Pua peninsula, and perhaps also some adjacent central points.

WADER MOVEMENTS.

Parengarenga Harbour contrasts with many other tidal areas in that the greater part of the daily passage with the tides is to the heads and outer beaches. Watt (1947) mentions these regular flights between the harbour and the east coast. They may best be seen, as described below, from the remarkable vantage places of Te Pua Point and Dog Island, with their view directly out through the entrance.

The latter is a minute residual islet some half a mile north of the point and situated towards the middle of the main channel. On the visit to be described, the island was reached while the tide was still flowing strongly: this was at noon and it was not until later at nearly high water that several large drifts of godwits were seen expanding, contracting and tailing off towards the heads. The return flight began as soon as the tide had begun to fall visibly at about 4.30 p.m., when the angle of the sun enabled the flocks to be seen coming in just above the water as they flew directly through the heads. These returning flocks, some of which passed close to the island, contained about 30-50 birds. They were observed for half to three-quarters of an hour by which time the surrounding flats were becoming exposed and the main passage of birds from the coast had ceased.

In the case of the outward movement it is probable that the particularly large flocks would form as the birds were pushed up from feeding grounds on the various arms. This was observed on a bay south of the Te Pua peninsula on 24/3/51, near the top of a high spring tide, when from some distance on the adjacent ridge a long string of godwits was seen standing in the rising water. A few moments later they rose suddenly in a wide skein and flew off rapidly down the bay. On the return, the small groups would follow the usual procedure, breaking off successively from the resting flocks soon after the turn of the tide.

With H.R.McK., D.A.U. and A.H.W., the writer visited the south head on 26/3/51 at the peak of a spring tide which, as was noted before leaving, covered most of the area of resting banks near Paua. A landing was made from the lagoon-like channel just within the entrance, and from a high point on the white dunes it was possible to look directly down upon a line of resting birds on the outer beach. Each species was in a separate group. A total was counted of 10 reef herons, 14 black-backed gulls, 19 Caspian terns, a white-fronted tern, c. 200 red-billed gulls, 2 oystercatchers, and c. 2,000 mixed godwits and knots (1,800:200). Godwits in smaller numbers (c. 250) and 45 oystercatchers could be seen opposite on the sandy point at the northern entrance.

In addition to this large flock on the beach a group of smaller waders was seen resting on low hummocks amongst the dunes, these proving to be 55 N.Z. dotterels and a solitary banded dotterel.

The godwits and knots of the nearer flock were disturbed and swept up in a massed display of flight before dividing into groups which passed to the north head and down the beach; a small group of the latter continuing across the widest part of the sandspit to the harbour, in low flight between the dunes. Later, on the return passage up the harbour with the falling tide, flocks of godwits appeared through the entrance.

This visit gave some impression of the outer resting grounds, although relatively few birds were seen. A general impression of the birds resting here is given by local information gathered by A.H.W. The high tide flocks would appear to congregate on two main areas—the long southern beach, known as Tai Tokerau, at least as far as the end of the Te Kao arm (c. 8 miles); and the small sandy beaches spaced at intervals along the coast to the north. The numbers seen in any locality would depend on the tidal rise. On the south beach, shooting, which still continues in spite of protection, may disturb the birds, which tend to move in this case to the northern beaches. A.H.W. has seen large flocks on the coast, including one of c.500 well down the beach to the south, and another of at least 10,000 godwits and knots referred to in his published account.

The birds which go to the southern part of the beach probably fly regularly across the intervening sandspit, which decreases in width towards the south, while as described above large numbers fly through the heads. The latter are thought by A.H.W. to pass mainly up the northern part of the coast. The birds coming in through the heads on the return flight for the most part follow the main channel towards the west, but some have been observed turning south into the Te Kao arm. There is apparently no tendency on the part of the birds passing to the northern portion of the coast to fly directly over the hills.

In bad weather A.H.W. has seen flocks of waders sheltering in the hollows between the east coast dunes.

There are two resting places situated on opposite sides of the Te Pua peninsula a few minutes' walk from Paua, and these are in regular use by resting birds except at particularly high spring tides. To the north-west a sandbank known as Kaiata is regularly covered with massed birds, generally including gulls, waders and reef herons. The bank is some 200 yards offshore, and this limits the possibility of close observation. A small sandspit on the peninsula opposite is also regularly occupied.

On the south-eastern shore, the sandy beach passing southwards from Te Pua Point ends in a sandbank projecting only slightly on to the flats. Behind this a small partly enclosed salt-marsh is closely covered by patches of the low dark brown herb, **Samolus repens**. A series of banks also clothed in **Samolus** and sedge rise above the mudflats beyond the spit. The sandspit and **Samolus** beds of this area, known as Raumanawa, provide resting grounds at most tides, although all except the bank submerge completely during springs.

On the first of a number of visits on 13-15/2/50 at an early stage of the rising tide, rough counts of waders were made at Raumanawa. The numbers of various species (15/2/50) were as follow:—Two flocks of each 800 godwits, 200 knots, 200 turnstone, 20-25 golden plover, 35 N.Z. dotterels, 200 banded dotterels and 30-35 wrybills. One Siberian pectoral sandpiper and 4 tattlers were also amongst the flocks. It was easy to stalk to within observing distance through the fringe of rush and sedge and to watch the arrival of group after group of godwits, turnstones and knots on the banks. With the rising tide most of the birds settled in resting attitude, with the notable exception of banded dotterels and wrybills, which continued to feed actively on the **Samolus** beds.

At higher tides, on the visits in February-March, 1950-51, waders in comparatively small numbers were observed grouped together on the banks at an early stage, but left considerably before high water. In bad weather on 27/2/51, with a particularly high tide banked up by the easterly gale, there were only a few godwits and a flock of banded dotterels crowded on the sandspit. The dotterels rose several times restlessly, and small groups of godwits and a single turnstone settled on the bank at intervals but again took off.

Godwits and knots, together with numbers of stilts and red-billed gulls, have also been seen assembled on the banks beyond the spit,

although at spring tides these are submerged. On 1/3/51, during the cyclonic storm from the east, considerable flocks remained on these banks until forced off by the rapidly rising water, finally flying off towards the east coast.

In addition to Kaiata and Raumanawa there may be a number of points at which waders assemble at lesser tides, although they are not in regular use. However, as already mentioned, it seems probable that such resting places within the harbour are comparatively few, and the two described, Kaiata and Raumanawa, may be the only ones regularly used. Both are known traditionally to local Maoris as puta (high tide rests) where godwits have always been taken.

SPECIES OBSERVED.

Pacific Golden Plover **(Pluvialis dominica fulva).**—The golden plover was regularly observed, but in small numbers as compared with the main flocks of wintering overseas migrants consisting of godwits, knots and turnstones.

A characteristic aspect of the wader population is that on Parengarenga Harbour turnstone, N.Z. dotterel, banded dotterel, wrybill and golden plover feed scattered over the flats in mixed flocks amongst godwits and knots. Golden plover and turnstone would sometimes be seen together, but a regular association of the two species in feeding and resting flocks was not apparent, although such is the case on the Manukau (Sibson, 1946). A good number of golden plover, and very considerable numbers of turnstones were present, so that there is some indication that for both species the harbour provides comparatively favourable feeding grounds, whereas on the large tidal areas about Auckland suitable conditions are possibly more restricted.

A resting flock of c. 25 of this species observed on Raumanawa bank on 13-15/2/50 were all in winter plumage, except for one with mottled breast; and two with patchy black underparts were seen February-March, 1951. A flock of c. 40, nearly all in advanced breeding plumage, were observed feeding in the bay south of Paua on 24/3/51 scattered over the **Zostera** (D.A.U.).

Banded Dotterel **(Charadrius bicinctus).**—Watt (1940-41-47) states that in late February and early March large flocks of banded dotterel appear on the paddocks at Te Kao; and that all but a few breeding in the valley disappear at the beginning of August. Stidolph and Fleming (1941) regard this as evidence of arrival on migration, but apparently do not account for the local breeding population. It is estimated (Watt, 1940) that about 100 pairs breed on the outer coasts of this northern block, and according to further information from A.H.W. a few also nest about Te Kao. It seems probable that the first flocks to appear in February-March would consist of birds from these local nesting grounds. According to the above authors such coast-breeding birds move to estuarine conditions at about this time, or to neighbouring grass lands (Stead, 1932).*

An influx of banded dotterels on migration was better indicated by the observations made in February and March on the harbour, when this species was seen both on the flats and at high tide on Raumanawa in numbers believed to be much greater than could be accounted for by the above explanation. On 13/2/50 a count of 60 was made at a point on the **Zostera** flats near Raumanawa, and there were some 150 more running in active search about the **Samolus** beds. These were for the most part in full eclipse or juvenal plumage, but included some with incomplete bands or only "shadow" bands. On 22/6/50 A.H.W. observed c. 200 on Raumanawa; and c. 200 were seen here on 26/3/51. Additional notes include: 26/2/47, one with almost complete bands amongst numbers in winter plumage on the flats; 27/2/51, of 30-40, about half had "shadow" bands; 9/1/51, some in quite bright plumage (A.H.W.); 2/8/47, nine, all in breeding plumage with partly developed bands (A.H.W.).

* Cf. a second report by Fleming and Stidolph (1951) in which it is proposed that local populations of this species should be assessed by colour ringing and a breeding census.

At the bluff on the west coast opposite Te Kao a single banded dotterel was noted on 16/2/50. Sibson (1940) gives an estimated number of 150-160 scattered along Ninety Mile Beach (9-15/5/1940).

New Zealand Dotterel **(Pluviorhyncus obscurus)**.—It was especially interesting that so many of this species were flocked together in winter plumage. A.H.W. has kept records of breeding in the harbour and on the east coast, and has recorded nests on rough pasture on the hills around Te Kao (Watt, 1947) and on the scrubby hill above Paua.

A flock on Raumanawa on 13-15/2/50 contained c. 35, of which 10 had a varying amount of faint red and the remainder were white below, the latter presumably including both eclipse and immature birds. On 26/3/51 a still larger flock of 71 was counted on Raumanawa. This was during the advance of a high spring tide. Later the birds had left, now at almost high water, and it was immediately after this that a visit was made to the south head where 55 were found resting amongst the sand dunes. These possibly represented part of the flock seen at Raumanawa.

After the visit to the harbour in February, 1950, A.H.W. examined some of the nesting sites about Paua and noted that there were some birds in the vicinity, while they continued to flock as described above at Raumanawa. On a ride up the east beach from Te Kao on 11/2/50 at about half-tide, N.Z. dotterels were observed along the edge of the dunes; and on 19/2/50, four were resting at high tide opposite Kaiata bank, on which (A.H.W.) there is generally a nest every summer. There is thus some indication that local birds remain fairly close to the neighbourhood of the nesting area in winter, and a suggestion that the birds flocking in the harbour may have been visitors from the south.

There are inland breeding records of this species in the centre of the North Island and southern South Island (Falla, 1940), but as far as the present writer is aware there is no information as to their winter quarters. Falla states that "most of the coastal birds appear to frequent the sand dunes throughout the year." It would be especially desirable to compare the distribution of this species in winter with their breeding distribution over the whole of the northern area, especially on inland scrub-covered hills, where they may nest in various localities as at Te Kao and Paua. A count by R. B. Sibson (1940, p. 28) on Ninety Mile Beach gave 50-60 between Ahipara and Scott's Point on 9-15/5/1940.

Amongst massed waders on Raumanawa at high tide N.Z. dotterels tended to keep separate from the others in a close flock, but would spread out to feed on the surrounding flats. At such times their size and white underparts rendered them most conspicuous amongst the other waders.

N.Z. dotterels were noted on the mudflats of the harbour on an earlier visit on 22/2/34. About 20 were then seen feeding together, all but one reddish bird being in "white" plumage.

Wrybill **(Anarhynchus frontalis)**.—The wrybill apparently reaches the harbour in fair numbers although the records during these visits have been irregular. It was observed feeding on the flats on the first visit in February, 1947, and a flock of 13 had been present on 26/1/47 (*Watt, 1947*). *The latter is especially early* (cf. Sibson, 1943) and might well indicate the approximate date of arrival on migration.

Records of numbers include 30-35 on Raumanawa, 13-15/2/50, in winter plumage; 12 at low tide, Raumanawa-Te Pua Point, 23/3/51. At the mouth of Kahika Stream on the coast east of Te Kao one was feeding in the stream estuary, 11/2/50.

Knot **(Calidris canutus)**.—For both knot and godwit the harbour is a major wintering ground. Watt (1948) also records knots remaining in the harbour during the winter of 1947 as follows: c. 100 (May); 18, 58, 42 (three in breeding plumage), c. *300* (*July*). *Most of those observed in* February were in typically pale eclipse plumage, but c. 200 observed closely at Raumanawa on 15/2/50 included several with red breasts; and a few were also noted in breeding plumage on 26/2/47 and 27/2-1/3/51.

But in late March (23/3/51) parties of highly coloured knots were constantly seen, one such party containing c. 35 all in bright brick-red plumage.

At the mouth of Ororongorae Stream on the east coast near Te Kao on 11/2/50, a flock of c. 20 knots and c. 20 godwits were seen.

Siberian Pectoral Sandpiper **(Calidris acuminata).**—The first record was a single bird in winter plumage with large flocks of waders at Raumanawa on 13/2/50. Close to the same spot at low tide on 24/3/51 three feeding in the **Zostera** beds were watched from only 12 yards distance. They were in full breeding plumage, the upper breast and sides being distinctly streaked, and the black and chestnut pattern on the back well marked. Quite undisturbed at this close range they darted after small "shrimps" which could be seen disturbed amongst the **Zostera.**

Red-necked Stint **(Calidris minuta ruficollis).**—D.A.U. observed two which were in full red plumage at low tide on 24/3/51 in the bay south of Paua. They were feeding in some seepage on the sandy flats at the head of the bay.

Sanderling **(Crocethia alba).**—There have been up to the present four specimen records of this species in New Zealand, all from the South Island. These include one obtained from the Waimakariri River in January, 1938, in addition to the three listed previously by Falla (1936). A sight record is that of one seen by A. C. O'Connor at Waikanae (Wodzicki, 1946).

The sanderling was first recorded in the course of the present observations when the writer observed three on 11/2/50 during a visit to the east coast beach. They were seen at the mouth of Ororongorae Stream a little north of Te Kao, where there were small groups of other waders, and the sanderlings had no doubt been feeding on the open beach before settling down to rest as the tide came in. From some distance as they stood on the sand in resting attitude they were thought to be wrybills, but they flew before very closely approached, and the difference could immediately be recognised. The first characters noted were the large amount of white on the face and white wing bar. The back was pale grey, but they were considered to be a browner grey than the wrybill, and this was confirmed when a solitary wrybill was seen feeding at an adjacent stream mouth. The birds settled at the edge of the waves, immediately beginning to feed. They moved at a quick, busy run, with the plump body held at a characteristic angle.

Again, on 19/2/50, the sanderling was seen, but on this occasion in the harbour at low tide on the flats between Te Pua point and Raumanawa. There was a group of five, and of these particularly good views were obtained for the birds took only short flights when disturbed, doubling back to continue feeding along the tide line. Although amongst other feeding waders, including stilts, godwits, wrybill and dotterel, they kept together in their compact flock, especially when disturbed: even though sometimes associating with a dotterel or other wader in passing, the flock continued with the same co-ordinated actions. Compared with other waders, the sanderlings were remarkably active, moving at an extremely quick run and making headlong darts towards their food.

Characteristics already mentioned were confirmed—identification marks noted were the particularly white plumage of both face and forehead, giving the characteristic appearance of whiteness seen from the front; the sandpiper-like bill, rather stout at the base; and short black legs. The only marking on the head was a very faint blackish shadow round the eye. The black anterior edge of the wing was also distinguished, in addition to the white wing-bar, and the pure white underwings. With some care the dark central tail feathers could be distinguished. In the field the much whiter head and shorter bill clearly distinguish the sanderling from the wrybill, quite apart from characteristics of action and appearance. In the distance, even after they had finally moved off across the channel, the effect of the very pale plumage was most noticeable.

It was interesting to hear from A.H.W. that on 13/4/1950 he saw five birds, from his description evidently sanderlings. They were in the same area and there seems little doubt that this was the same flock: of equal interest is the fact that the plumage described was still eclipse. McGill (1951) emphasises that in Australia the sanderling, which he observed from August to April during some years' observations showed no sign of acquiring breeding plumage, in contrast with most overseas migrants. The latest observation in any year made by McGill was April 3.

Sanderlings were not observed on the short visit in February, 1951, but on 23/3/51, with H.R.McK. and D.A.U., one was seen between Raumanawa and Te Pua at low tide. Again the comparatively white plumage and extreme activity of the sanderling enabled it to be distinguished clearly amongst dotterels and other waders, although it was at some distance.

The sanderling is generally regarded as strictly coastal, especially frequenting sandy beaches, and McGill (1951) regards it as closely restricted in Australia to suitable beaches. There are also accounts of this species feeding on mudflats and at times on muddy or sandy inland marshes or lakes. Both observations inside the harbour have been on the hard, sandy mud of the Raumanawa-Te Pua Bay, where the effect of the sandspit opposite is no doubt to increase the sand content of the flats.

The above observations clarified an inquiry made in 1948 to the writer by R. H. Michie. He described a bird seen in the summer of 1947 near Te Arai Bluff on Ninety Mile Beach, but from the description no conclusion concerning this bird was reached. On 15/11/49 this observer saw another bird of the same kind on the edge of a fresh water lagoon in the sandhills near Te Arai, where the only other waders were N.Z. dotterels and nesting stilts. On reference to James Fisher's "Bird Recognition" (Vol. 1) he decided that these were likely to be sanderlings: that this identification was probably correct was later confirmed in discussion with the writer.

Bar-tailed Godwit **(Limosa lapponica baueri)**.—Watt (1947) states that the numbers of godwits are much the same throughout the summer, from arrival about the second week in September to departure in March. There is a small over-winter population, in flocks generally of up to 60. On 22/6/50 A.H.W. observed 2-300 at Raumanawa; and an exceptional flock of c. 1000 was recorded by this observer on 15/8/47 (Watt, 1948). Before and after this date only the usual winter numbers had been seen, and the occurrence of this number in August perhaps indicates some degree of movement by birds which remain in New Zealand over the winter; it would certainly be extremely early for the arrival of migrants.

Some of the observations made in the harbour indicating stages of plumage are as follow: 13/2/50, at Raumanawa, most were pale, only a few bright red (males) being present; 27/2/51, of c. 200 on Raumanawa, most were pale birds; 1/3/51, of c. 200 about one-fourth were in high colour. Females in breeding plumage, which consists of a faint, irregular wash of colour below and upperparts a little brighter, were not distinguished from birds in eclipse plumage.

Godwits, knots and turnstones were noted at stream estuaries on the eastern coast, and Watt (1947) refers to flights to the west coast which were constantly observed from Te Kao. The distance to the coast from Te Kao is 4½ miles to the west and 3½ miles to the east. It would be interesting to have further observations of godwits, and possibly knot and turnstone, on both east and west sides of the northern isthmus which might indicate whether there is a fairly constant population on these ocean beaches.

Some evidence of the numbers of godwits generally found on Ninety Mile Beach is given by a count at low tide on 1/1/50 made at the request of H.R.McK. by M. J. Thorn. A meticulous count resulted in a total of 105-110, one flock of five birds probably being seen a second

time. They were scattered evenly along the beach in groups of 1-40. R. H. Michie has further informed the writer that in many years' experience he has not seen more than a few flocks of up to 40 on Ninety Mile Beach, the total for the whole distance being usually c. 100. He writes that on a trip up the beach in early May, 1950, several scattered flocks were seen, numbering not more than 20 in each.

It seems likely that in this region, at least, the relationship of godwits seen on the beaches is essentially that of stragglers from the main tidal feeding grounds, which would include Parengarenga and probably Hohoura and other harbours further south.

The writer has also inquired from sportsmen of their experience in shooting godwits on various ocean beaches during the season in February before the enactment of protection. The impression received is of godwits in comparatively small numbers, scattered as suggested by the above observations, fairly evenly along the beaches. A further interesting indication of local movement is a note from R. H. Michie of large flocks seen in mid-summer flying over Great Exhibition Bay, on the curve of the isthmus separating Parengarenga from Hohoura and other tidal areas to the south.

Certain aspects of the departure of the godwit on migration may be mentioned briefly, although little factual evidence is available of the manner in which the birds leave. As recorded by Watt, departure takes place in March, when the main body disappears from the harbour.

An experience on 26/3/51 on the flats off Te Pua peninsula is particularly interesting as it seems probable that a departure was actually seen. Two compact flocks each containing 150-200 godwits appeared near the flats, at low tide, calling strongly as they flew past. Their flight was followed as they rose above the peninsula, but instead of dropping to the northern channel, they circled widely ascending to some height. The two flocks were followed in the field glasses, rising in a spiral path towards the north, where they were finally lost to sight. They included a proportion of bright red-plumaged birds. It seems probable that this procedure, which has been witnessed in previous years by A.H.W., is that followed as the urge to depart reaches its peak; and would take place whether the birds were on feeding grounds or congregated at high tide.

Watt (1949) describes a large flock seen two miles off the east coast, flying in a northerly direction on 19/3/48. Kaka Wiki has seen very large flocks at the south head in late February and early March, calling loudly and rising excitedly if disturbed, when they tend to fly north along the coast towards Ngakengo and similar beaches; and it seems likely that such flocks may also be ready to leave at high tide.

The latter observation is significant in explanation of the common belief that a mass departure of godwits in tremendous numbers takes place from Spirits Bay. This undoubtedly owes its origin to James Buckland, the author of an account of the migration of the godwit, in which he claims to have seen almost fabulous numbers massed along Spirits Bay on a visit apparently early in April, and to have witnessed their departure. This article entitled, "One of the Most Remarkable Sights in Nature," was published in the "English and Illustrated Magazine" (1896, pp. 71-75), a photostat copy of which has been available through the courtesy of the National Library Service. Although in one place Buckland refers to Spirits Bay as amongst the spots from which "to see the kuaka fly from the shores of New Zealand," he stresses especially his description, now so deeply lodged in godwit lore, of countless numbers collecting at Spirits Bay before they depart. An artist's impression which is included, shows a rough topographical approximation to Spirits Bay with the beach and sand dunes, literally, covered with godwits.

Out of much imaginative detail in Buckland's account, there is nothing to indicate that the place described was in fact Spirits Bay; but

in the writer's opinion high tide flocks, especially on the east coast, could well give rise to a description such as Buckland's. He would perhaps see such a flock if not at Spirits Bay, at one of the beaches mentioned above in the course of a visit to the north.

In addition to his numerous visits, including several with the writer, A.H.W. has for some years endeavoured to find any evidence locally that godwits have been seen at Spirits Bay. The only information was from H. Murupaenga, of Te Hapua, who told him that his father, when a young man, on one occasion saw large numbers of godwits resting on the grass at the eastern end (Kapowairua). The weather was very bad, and it was thought that the birds had returned after setting out on their long flight. The same informant saw from Te Hapua on *10/9/50* several flocks containing some thousands come in past the high peak of Unuwhao and fly to the harbour, thus perhaps observing the arrival from overseas.

In summary, it must be evident that in a region so constantly visited as Spirits Bay any regular assembling and departure of the birds could hardly have escaped notice. Buckland's account should be regarded as either of an exceptional occurrence, perhaps due to particularly bad conditions (he says the weather was "tempestuous"), or, as suggested above, may be inaccurate as to the locality.

The popularity enjoyed by the account is probably due largely to its appearance as a fairly long quotation in James Drummond's "Nature in New Zealand" (edited F. W. Hutton), published in about 1902 and widely used in New Zealand schools. The article was quoted at some length in a contribution by T. White (1898) to the Journal Polynesian Society, Vol. 7, p. 178. It gained credence also when Buller quoted it in his Supplement (1905); and this in turn was incorporated in the standard work by Oliver.*

As regards any northward movement of godwits at the time of migration, Watt's observations provide no evidence that the numbers of godwits or of other common overseas migrants in the harbour increase in the period immediately before migration. It seems likely that flights would be seen at this time if migrants were moving up from the south, but there is no evidence that this is the case.

Grey-tailed Tattler **(Heteroscelus incanus brevipes).**—On 13/2/50, amongst massed waders gathering at high tide, the writer first saw a tattler at Raumanawa. Four were seen at fairly close range on 15/2/50 amongst the large flocks of waders resting on the bank, and on this occasion it was possible to obtain particularly clear views. These first observations gave a good impression of the markings and characteristics of this slim, graceful wader, the most noticeable characters at first being the uniformly grey upper plumage, narrow black eye-streak and greenish-yellow legs. On closer examination other details of plumage were: throat and upper breast pale grey; the remaining underparts pure white; white superciliary streak, which passes forwards into a distinct white frontal patch.

In general appearance the tattlers contrasted with the more stocky build of knots, turnstones and N.Z. dotterels, their greater height and more upright attitude giving them the appearance of standing head and shoulders above these species. The bobbing action was less spasmodic than that of the dotterels, the whole body moving as if more finely adjusted. When standing or running, especially if disturbed, the attitude was the alert one described above, but they would also hunch up in the relaxed attitude usual in resting waders. Their flight was fast and graceful with the pointed wings distinctly arched.

* Buller in the 1st. ed. of his "History of the Birds of New Zealand" (1873) states that "large flocks may be seen at the far north taking their departure from our country," but in spite of a description of the departure which follows, there is no indication as to whether Buller based his account on the information of eye-witnesses. The only reference as to locality comes in the 2nd. ed. (1888) where Buller adds that Mair saw godwits flying northwards in large flocks "near the North Cape."

The call could not be distinguished at first, as the birds rose with flocks of other waders, and only once a call was recognised resembling the musical note of the golden plover which was thought to be that of the tattler. This was confirmed on 19/2/50 when a tattler flew up at low tide and before alighting gave a distinctive double note. This first impression of the call was repeated during the later observations of 27/2/-1/3/51, when it was recognised as a clear whistle, generally of only two distinct notes which might be described as "whew-rit" or "whewew-reet," the final syllable being emphasised and higher in pitch. The distinctive call was again noted and carefully recorded by H.R.McK., D.A.U. and the writer on the last visit in March, 1951.

A.H.W. saw tattlers on several occasions after the observations in February up to the end of March, 1950—three at Raumanawa and six on the other side of Te Pua peninsula at Kaiata; but nothing was seen of them on a visit to Raumanawa on 22/6/50. On 10/1/51 the same observer saw two at Raumanawa.

They were observed again by the writer on his next visit: on 27/2/51 one was seen for a moment flying above the submerged banks of Raumanawa in bad weather; and two were observed at low tide on 1/3/51 on **Samolus** beds. One of the latter was in fresh plumage, almost blue-grey on the back and with well-marked half-bars showing distinctly on the sides. The other had not begun to change plumage, and the colour of the back appeared distinctly browner than that of the first bird. These tattlers could not be approached closely, and fed on the banks with a few stilts, dotterels and golden plover. On the visit on 24-26/3/51 a tattler was observed several times on the flats near Raumanawa at low tide, but never allowed an approach nearer than c. 30-40 yards.

It was realised in attempting to identify the subspecies of these tattlers that there was much doubt as to whether the grey-tailed tattler **(H. i. brevipes)** could be distinguished from the American tattler **(H. i. incanus)** in winter plumage (cf. Serventy, 1944). As far as could be judged all these birds recorded on the harbour were alike, and although they were seen on various occasions the same characteristic call-note was heard on every visit. In considering possible field distinctions, the writer has been able to discuss his observations with H.R.McK. who had become thoroughly familiar with the single **incanus** which he recorded at Kawakawa Bay (McKenzie, 1949), and H.R.McK.'s visit to the harbour in March, 1951, enabled a most helpful comparison to be made.

Distinctions between the two subspecies in non-breeding plumage are, as given by various authorities (Witherby, Mayr, Stickney, Serventy): **brevipes** is slightly smaller; with a shorter nasal groove; grey breast band narrower (Mayr); upper parts lighter grey. In **brevipes** there is white barring on the rump which is absent at all stages in **incanus**. White rump bars may not always be present in **brevipes**, as indicated by Bull (1948) who describes the upper tail coverts of specimens from the Solomon Islands area in winter plumage as having only the faintest trace of pale tips. Serventy (1944) found this characteristic developed only in fresh plumage. It will be evident that most of the above characters, especially size and depth of colouring, would not be distinguishable unless both were seen together, or under especially favourable conditions.

The white bars on the rump could not be seen in any of the birds observed, the coverts as described above appearing uniformly grey; but it should be noted that the only bird undoubtedly in fresh plumage (1/3/51) was not seen closely.

McKenzie (1949) was able to distinguish the relatively long nasal groove of the **incanus** at Kawakawa Bay at close range under especially favourable conditions. Further experience may show that **brevipes** can be recognised similarly in the field, although in the writer's opinion it would be more difficult to establish the length of the groove which in this case is only a little less in actual measurement than that of **incanus**.

As may be seen in specimens of **brevipes**, the well-defined portion of the groove passed forward into an indefinite furrow, which might also be visible.

The most interesting stage in plumage observed was that of the bird seen on 1/3/51, which had developed distinct bars on the sides of the breast. This pattern is characteristic of **brevipes** in breeding plumage, but unfortunately is not conclusive alone, as **incanus** apparently passes through a similar stage before passing into the heavily barred full breeding plumage. This was observed in the case of the Kawakawa Bay bird which remained over the winter, passing through a change of plumage.

In comparing his Kawakawa Bay observations with those on the harbour, H.R.McK. was impressed by the comparatively pale grey of the latter bird and its more erect attitude, especially when disturbed. H.R.McK. agrees with the writer that as the observations were made on single birds in each case, the comparison of these points should be regarded as tentative. H.R.McK. also suggests on hearing the writer's description of the double whistle, that a difference in calls might enable the two subspecies to be distinguished.

At the time of these visits to Parengarenga Harbour, the only description of the call of **brevipes** known to the writer was Bent's reference (1929) to the following description by G. D. Hanna of both subspecies at the Pribilof Islands: "The actions of the two . . . were practically the same . . . . The wandering tattlers on this occasion appeared perceptibly larger than (the grey-tailed) and the notes of the two were different. The latter uttered an irregular screech not of the same intensity in pitch, whereas the former gave its usual call, a series of 6 to 10 individual notes uttered in the same pitch and rapid succession, but each of shortening duration." The former term "an irregular screech not of the same intensity of pitch" appeared fairly closely applicable to the double note heard, while the latter give a good indication of the usual note of **incanus**, as described in various accounts, and noted at Kawakawa Bay (McKenzie, 1949). H.R.McK., after hearing the call on Parengarenga Harbour, confirmed that it had no resemblance to that of the latter bird.

Recently a more satisfactory description of the usual call-note of **brevipes** was received by the writer through the kindness of A. R. McGill and K. A. Hindwood, who forwarded field notes on the two subspecies in Australia. Hindwood's notes describe the characteristic call of **brevipes** as "a double 'too-wheet' rather closely resembling the call of the golden plover but somewhat sharper and louder, the second note higher in pitch than the first." The writer's attention was also drawn to the description of the call by Keast (1949) who says that it is a plaintive "peeep-peeep-pip-pip-peeep although just two or three syllables are more frequently used. The species is very vocal in flight." The above, describing so well the call note of the birds observed on Parengarenga, provides fairly conclusive evidence that the birds were in fact **brevipes**. It would certainly appear possible to distinguish the two subspecies in the field by their characteristic calls, the change in pitch described in all accounts being apparently typical of the usual call of **brevipes**.

Comment may be made on habitat with reference to interesting descriptions of the grey-tailed tattler in Australia in accounts by Keast (1949) and Hindwood (1942). It is observed quite commonly on exposed coastal reefs, but rarely elsewhere, near Sydney; and occurs in greater numbers on the Hunter River some 90 miles to the north, where it feeds on mudflats apparently quite similar to those of Parengarenga Harbour. If, as seems likely, its New Zealand distribution is restricted to this locality only, an explanation might be found in Keast's suggestion that it shows a well-marked preference for certain types of habitat.

The writer's notes of a visit to the harbour with R. A. Falla on 22/2/34 record an unidentified slender wader of rapid flight which would now appear to have been a tattler.

Whimbrel **(Numenius phaeopus subsp.)**—A.H.W. describes one bird, apparently a whimbrel, with other waders at Raumanawa on 22/6/50. The call was recorded as a high-pitched "cree" repeated several times.

Long-billed Curlew **(Numenius madagascariensis)**.—One was recorded as present continuously on the harbour for three years (Watt, 1947, 1948, and was seen by the writer on 26/2/47 on Kaiata bank; but this species was not observed in 1950-51.

Turnstone **(Arenaria interpres)**.—This would appear to be a particularly favourable locality for the turnstone, which is so localised in distribution throughout New Zealand: on the present observations it would rank not far below the knot in numbers. Observations at Raumanawa have been mentioned, including a count of c. 200 on 15/2/50. A.H.W. recorded c. 50 here, 21/3/50. When resting at high tide this species kept in close flocks separate from other waders. Counts of birds on sections of the flats were: several of c. 30 in one locality (13/2/50); c. 60 in another locality (27/2/51); 70 plus feeding with other waders 23/3/51 (D.A.U.). A flock of c. 50 was seen at the Ororongorae and later the Kahika Stream mouth towards mid-tide on 11/2/50.

A few have been recorded in winter (Watt, 1945).

Pied Stilt **(Himantopus h. leucocephalus)**.—Stilts were observed regularly: as recorded by Watt (1940, 1947) the numbers at all seasons are only moderate, although an increase is noted every autumn. A few breed on the north coast, some near Spirits Bay; these are evidently still on their breeding grounds as late as 22/2/50, for on this date they were present in Sandy Bay, just east of Cape Reinga. Counts on the harbour, include: 23/3/51, c. 100 on the small bank opposite Kaiata; 22/6/50 (A.H.W.) 100 plus at Raumanawa.

Oystercatchers **(Haematopus spp.)**—The North Island oystercatcher **(H. reischeki)** breeds on the neighbouring ocean beaches, and, although often too distant for identification, mixed groups of black and pied birds were probably of this species. Up to 40 have been seen feeding on the flats together; c. 20 were seen on 25/2/47 with reef herons and numbers of red-billed gulls on a permanently exposed shell bank known as Ahi Aruhe, near the entrance. Here oystercatchers have generally been seen subsequently, although the bank is not much used by other waders. On 11/2/50 scattered oystercatchers were seen along the east beach as far as the heads, and in groups of c. 12 at stream estuaries.

Two records of birds believed to be South Island pied oystercatchers **(H. finschi)** were made: one on 1/3/51 at Raumanawa, and two on 24/3/51 off Te Pua Point; but should remain doubtful until further records are made.

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ORNITHOLOGICAL PHOTOGRAPHS.—The National Publicity Studios are building up a collection of bird photographs, and members are invited to view the prints at the Photo Library, National Publicity Studios, 125 Lambton Quay, Wellington. Prints may be purchased, but reproduction is allowed only in official publications and the Ornithological Society's journal.

REQUEST FOR BIRD LICE FROM NEW ZEALAND TERNS.—Studies of the feather lice **(Mallophaga)** parasitic on birds has in the past led to interesting inferences on the affinities of the "host" species. Dr. G. Timmermann is at present undertaking a study of the lice of the gulls and terns with a view to elucidating their relationships. He writes that his material from South Pacific terns is very scant and wishes to borrow lice from the following New Zealand terns: White-fronted tern **(Sterna striata)**, fairy tern **(S. nereis)**, black-fronted tern **(Hydrochelidon albistriata)** and Caspian tern **(Hydroprogne caspia)**. Feather-lice may be found by careful search through the feathers, especially of the head and neck, of dead or live birds, or, sometimes, of dry study skins. They should be preserved in small glass tubes of 70 per cent. alcohol with a pencilled label indicating name of host, locality, collector and date. Dr. Timmermann predicts that lice from New Zealand terns will be new to science and offers to return type specimens to New Zealand institutions. The dead birds occasionally found in tern colonies may enable members of the O.S.N.Z. to assist this research and eventually enrich New Zealand museums in identified specimens of an obscure group of animals. Any member who succeeds in collecting lice is invited to send the specimens to Dr. G. Timmermann, the University Research Institute, Fiskideild, Borgartuni 7, Reykjavik, Iceland; or, if more convenient, to C. A. Fleming, 42 Wadestown Road, Wellington, for transmission to Iceland.—C.A.F.

GODWIT INQUIRY.

FIRST INTERIM REPORT.

By R. H. D. Stidolph, Masterton.

The Ornithological Society is conducting among its official projects an inquiry into the present status of the bar-tailed godwit **(Limosa lapponica)** in New Zealand, and members are invited to assist by sending information relative to this bird to the writer, who is organiser of the project. All contributions used will be acknowledged.

An analysis of information to date in publications of the Society shows that the most favoured haunts of the godwit are the tidal flats of the Auckland and Nelson districts. These are enumerated more particularly as follow:—

Auckland District (from north to south).—Parengarenga Harbour, Whangarei Harbour, Kaipara Harbour, Manukau Harbour, Firth of Thames, Tauranga Harbour, Ohiwa Harbour.

Nelson District.—Farewell Spit, Golden Bay.

In all of the above localities the godwit may be seen during its non-breeding season in large numbers, and there are records of birds remaining in these areas, except Farewell Spit and Golden Bay, during the New Zealand winter, at a period when the vast majority has returned to the Northern Hemisphere to breed. It is probable that some birds remain in the Farewell Spit-Golden Bay area for the austral winter; reports from this district are exceptionally meagre.

Other localities favoured regularly by the godwit in New Zealand are (from north to south):—

North Island.—Ninety-Mile Beach, Mangowai, Muriwai, Clevedon, Raglan Harbour, Kawhia Harbour, Napier, Porangahau and Waitotara, Rangitikei, Manawatu and Ohau estuaries.

South Island.—Wairau Bar, Waimakariri Estuary, Heathcote-Avon Estuary, Lake Ellesmere, Teramakau River, Okarito Lagoon, Waikouaiti, Otago Harbour, near Invercargill and Paterson's Inlet (Stewart Island).

Members who have information regarding additional haunts of the godwit are invited to make it available, so that an accurate map giving details of its occurrence in New Zealand can be prepared. Odd birds or small flocks are liable to be seen in almost any coastal area where there are sand or mudflats, especially at river-mouths, but it is intended to map only those places inhabited regularly by the godwit. More precise information is desired, particularly about the presence or absence of the godwit in the estuaries near Invercargill and other parts of Southland. The Hokianga Harbour area of North Auckland and Kawhia and Raglan harbours are others about which more information is needed.

Members are invited to give particulars of the numbers of godwit in their districts, whether fluctuations occur, and particularly, dates of arrival and departure, and of the number remaining for the New Zealand winter, or other information relating to the movements of this bird. Particulars of habitat, plumage (i.e., proportion of red-breasted birds, especially in autumn) and association of other waders with godwits (for instance the knot commonly mingles with flocks of godwit, its numbers in some instances being equally at great as those of the godwit) are desired.

It is suggested that members placed at strategic points adjacent to known godwit haunts could keep a close watch on the species for the next few years (some members are already doing so) so that a comparison may be made from year to year. If this is done, the information gained should throw some light on the present position of the bird in New Zealand.

BIRD NOTES FROM THE BROTHERS ISLAND.

By J. H. Sutherland, The Brothers.

The observations recorded here were made by keepers at The Brothers Lighthouse from August, 1950, to February, 1951. Keepers have an advantage over visiting bird-watchers in that their observations can cover longer periods, but many opportunities of gathering interesting material are necessarily lost while keepers are on duty. These notes are, therefore, not complete.

The Brothers Island is a rocky cone in Cook Strait rising 200 feet from the sea. It is the northernmost rock in a group reaching about a mile S.S.W. from the lighthouse. It is about three miles E.S.E. of the nearest point on Arapawa Island. It has a light soil which grows shore koromiko, taupata, tussock, Maori ice-plant, shore groundsel, salacornia and a few other plants.

In the group of rocky islands there are seven large enough for birds to nest on. Strangely, only three have been chosen—the lighthouse island and two others nearby. The largest island of the group, the Big Brother, seems completely ignored. But since we are confined to our island we cannot be sure that penguins or petrels do not nest there.

Dove petrels, little blue penguins, white-fronted terns and red-billed gulls nest here and it is thought likely that diving petrels may do also. In fine weather we are visited by sparows, white-eyes and fantails. Harriers, giant petrels, Marlborough shags and black-backed gulls are seen occasionally.

Dove Petrel **(Pachyptila turtur).**—Most nights in the autumn, winter and spring, "doveys," as we call them, are about in great numbers. They sometimes keep us awake, especially on wet nights, when they seem to offer hymns of praise for the rain. We found the first "dovey" egg, 10/8/50. Later, eggs were often found at the mouths of burrows. During and after November, chicks were sometimes found dead, apparently killed by red-billed gulls. One accidentally excavated, 19/1/51, was able to fly away though it was not quite fully fledged. By February, the burrows all appeared to be empty.

Diving Petrel **(Pelecanoides urinatrix).**—Odd divers were seen during the early months of the period, but no notes were taken. On the night of 17/1/51 Mr. Dawbin, of Victoria College, found one dead, and heard several others. After sunset on 2/2/51 I watched many fly in from the sea. Divers hide in the shrubs and it is not easy to make a count, but I think there were about 100 on the island that night. At midnight, 30/2/51, when the weather was calm, cloudy and raining next day, there were as many here as I have yet seen. I put the number at somewhat over 300.

Little Blue Penguin **(Eudyptula minor).**—These birds are more often heard than seen. They get under the buildings and their cries are sometimes like a child sobbing and sometimes like a door swinging on rusty hinges. Wet nights seem to bring them out, but I have no record of the actual dates. While clearing rocks on 6/9/50 keepers disturbed one on a nest. The egg was broken before it was noticed and was fresh.

Red-billed Gull **(Larus novaehollandiae).**—During September and October the gulls began arriving but no note was made of the date when they first appeared in numbers. It was not possible to make a count, but over a thousand nested on these rocks this year. Chicks were first seen 17/12/50. By 23/12/50 the eggs were hatching in numbers. On 29/12/50 a north-westerly storm killed many chicks. By 1/1/51 most of the chicks were hatched. All were flying by 9/2/51. Gulls were seen killing and eating chicks of their own species, and many were found dead, but we think about 500 survived.

White-fronted Tern **(Sterna striata).**—During November, terns arrived and began nesting. The number was considered to be over 500. The first tern chicks were seen 9/1/51. Red-billed gulls were often seen

eating tern eggs and chicks. From one group of 20 tern nests only four chicks survived. We think under 100 chicks survived in all. By 30/1/51 the chicks were all flying and after 9/2/51 the terns had gone.

Marlborough Shag (**Leucocarbo carunculatus**).—One was seen on the rocks 15/12/50, and one on the island well above the water, 28/1/51.

Giant Petrel (**Macronectes giganteus**).—One was seen drifting in the rip, clutching a red-billed gull and eating it, 26/12/50.

Stilt (**Himantopus himantopus**).—One was found dead at the foot of the tower after a southerly storm, 17/10/50.

NOTES FROM THE CHRISTCHURCH ESTUARY.—During November and December, 1950 and early January, 1951, I made many journeys to the Christchurch Estuary, accompanied by Mr. B. Jones and Mr. T. Lawson. The birds seen were:—Paradise duck: A pair, 17/11/50, female immature. Grey duck: Often seen at high tide. On 12 and 13/1/51, 30 seen feeding with pied stilts at low tide. Canadian Goose: Heard about 10 p.m., too dark to be seen, 17/11/50. Black Swan: Two seen at rest; only there for short period. Caspian Tern: First seen 4/1/51, resting with 17 red-billed gulls. The following eight days Capsian terns were seen diving for food in all parts of the estuary. White-fronted Tern: Not over 100 on the estuary but to be seen more frequently during winter. Black-billed Gull: Not as common as the red-billed gull; an approximate count showed about 50; more common on Avon River. Red-billed Gull: One of the most common birds on the estuary. An approximate count on 12/1/51 gave about 300. At low tide seen feeding among oyster-catchers and black-backed gulls, and at high tide resting on the Mt. Pleasant jetty and New Brighton sandspit. Black-backed Gull: About 250, 90 being immature. Bar-tailed Godwit: One of the commonest birds on the estuary, numbering about 380 to 400. Banded Dotterel: Occasionally seen in small flocks, near New Brighton sandspit. South Island Pied Oystercatcher: Not common on the estuary in summer; on 12/1/51 about 100. At high tide the oystercatchers cross the spit to Brighton Beach. Pied Stilt: Increased to about 200, about 80 immature. At high tide stilt congregates near the Pleasant Point Domain. Kingfisher: Nest in cliffs at Redcliffs and McCormack's Bay. Spotted Shag: Fly over estuary but never seen feeding. During low tide these birds rest and dry themselves on Shag Rock. Black Shag: Numbers seen diving at high tide and at low tide drying themselves on the sandspit. Reef Heron: Pair seen on estuary since May, 1949. Harrier: One flying across the estuary above a flock of godwits and oystercatchers dived among them and set the entire flock into flight. Pukeko: Seen in the swampy areas around the estuary.—David E. Crockett, Christchurch.

RED-BILLED GULL SNAPPING AT FLIES.—On January 27, 1951, at the Waipapakauri turn-off on the Ninety-mile Beach, I saw a red-billed gull sitting by the smelly remains of a stingray and snapping at the flies that surrounded it in a cloud. After watching it for some minutes I went away to lunch. On returning about an hour later I saw a gull at the same place occupied in the same way as before. If it was the same gull it either had a tremendous capacity for blow-flies or else it was a very poor marksman.—A. H. Watt, Awanui.

MYNAS OUST SPARROWS.—Although mynas are becoming more common in Howick it was only in January, 1951, that they started to be regular inhabitants of our garden. They began their rather unwelcome and noisy stay by throwing out a number of young sparrows from their nests in a tall palm tree. On January 16 I found four fledgling sparrows and one immature bird (probably about a fortnight old) all lying dead underneath the tree. Each bird had a peck on the side of the neck. Even as I picked up the little corpses the two mynas were squawking loudly and flying in and out of the many sparrows' nests in the tree.—Noelle Macdonald, Howick.

SPUR-WINGED PLOVER IN NEW ZEALAND.

By Olga Sansom, Invercargill.

The spur-winged plover **(Lobibyx novaehollandiae)**, an Australian bird, appears to be establishing itself in the vicinity of Invercargill. At least two local residents saw nests, each containing two eggs, in 1947, while last year, 1950, a nest of three eggs was found. It is estimated that there are at least 100 birds within a ten-mile radius of Invercargill and there may be more further afield.

The first news many people outside of Invercargill had of this colony was given in a broadcast by the Rev. C. J. Tocker, in 1940, in which he said there was a small colony near Invercargill. About 15 years ago, Mr. George Moffett saw seven birds in a grass paddock near the Borstal Farm, Invercargill Estuary, which at first sight he thought to be red-billed gulls. Attracted by their persistent raucous cry and their shyness he investigated further, identifying the birds as spur-winged plover, or alarm birds. Later, others reported their presence near the city. In 1943 a shot specimen was sent to the Southland Museum for identification. Elsewhere, in recent years, in New Zealand odd birds have turned up with increasing frequency at places as far north as Waitotara in the North Island.

Localities near Invercargill in which the spur-winged plover have been seen are the swampy ground on the Borstal Farm, near the Aerodrome (Invercargill Estuary), on the northern foreshore and the southern end of the foreshore of the estuary; cultivated paddocks on the east side; near the mouth of the Waimatuku River; on Mr. Price's property on the Oreti River near Oporo (five to six miles from the mouth), and on Mr. Wm. Fosbender's property at New River Ferry. This property, a fairly extensive area of sheep run, sand dune, natural tussocky country, marsh-land and flax-encircled lagoons appears to be a favourite habitat.

Mr. McKenzie, the manager of this property, who for many years has mustered the area, estimates 50 birds in the whole range of habitat there. Inquiries from reliable sources, including Mr. W. Fosbender, Mr. A. B. Moffett, Mr. A. H. Hamilton and Mr. Geo. Moffett consider Mr. McKenzie's estimate a fair one. They would add another 50 birds from other areas making a total of 100 birds.

Two residents saw nests in 1947, viz., Mr. Christie, manager of the Borstal Farm, and Mr. W. Fosbender. In each case the clutch was two eggs. Last year (1950) Mr. Wilfred Fosbender saw a nest of which he gives the following description:—

"Nest on bare shingle, very carelessly made. Three eggs, the size of a bantam's or somewhat smaller. Colour, light greenish-yellow, spotted and speckled with brownish-black. On approaching nest bird made vicious dives at his head. About 10 days later, in August, Mr. Fosbender saw three very lively chicks.

My notes relative to this bird in 1950 are:—

June 18.—Saw 17, the most I have seen in one day, as follow: Near Lagoon, Fosbender's Farm, four; on roadside, near Lagoon, two flew up and settled further up; on swamp edge, roadside, eleven feeding at 4 p.m. (dull day).

June 25.—At the same place saw eight plovers.

November 1.—Visited Fosbender's Farm, usual haunts, saw none. The musterer had seen eight that morning but they were not there at 4.30 p.m. on a bright sunny afternoon. He will look for nests during week.

November 2.—Went to Price's Farm, Wallacetown. On shingle and river banks there were black-billed gulls, black-fronted tern and dotterel, all obviously nesting. The tern dive-bombed at me beautifully, with more grace than any plane and loads of defiance. No spur-winged plover. I had seen a pair here a little further inland last year.

November 4.—Visited Borstal Farm. One pair feeding on swamp. Had very good view of them through binoculars. (Starlings feeding nearby). The watermilfoil, buttercup and cotula made a flowery carpet for yards. The spur-wings were beautiful, the wattles like orange peel. They flew low, up the swamp and settled again. They did not complain or seem agitated as a nesting pair might do.

(The spur-winged plover, on the application of the Southland Acclimatisation Society, has been declared a protected bird.)

OBITUARY.

The death occurred in Auckland on June 9, 1951, of Major G. A. Buddle, D.S.O., M.C., a foundation member of the Ornithological Society of New Zealand. He was well-known for his photographs of wild life, including birds, and his scientific visits to the Three Kings, Poor Knights and other islands off the coast. Contributions to the society's bulletins included: Notes on the birds of Mokohinau, breeding of the red-billed gull, gannets of Three Kings and elsewhere north of Auckland, and birds of Three Kings and neighbouring waters. In the "Emu" he had articles on photographing the spotless crake on the Poor Knights, notes on the breeding habits of the dabchick, and two papers on the birds of the Poor Knights. He took a keen interest in the affairs of the Auckland War Memorial Museum.

Another member of the Society, Mrs. A. S. Wilkinson, died on December 1, 1950. She had a wonderful knowledge of bird life, much of it gained during her 18 years on Kapiti Island bird sanctuary, and it is some satisfaction to know that she left carefully written notes on the birds of that island, written from day to day during her residence there. An expert photographer, she secured an unrivalled series of studies, not only of bird-life, but of the native flora, insects and other natural history subjects, which provide an impressive memorial of her work. Photographically, one of her achievements was the feeding of a young long-tailed cuckoo by its foster parent, the whitehead. She tamed many of the wild birds coming around her house on Kapiti, her most notable success, after many months' of patient work, being achieved when three kakas fed from her hand.

BREEDING OF WEKA.—I used to wonder how it was that wekas increased at such a rate from one pair. On Bravo Island, where I have a shack, the breeding habits of the only pair on the island, which have been there a long time, are interesting and seem to follow the accepted theory. They have two young in the very early spring, two in mid-summer and in late summer two or three and even, on one occasion, four. The young ones are looked after solicitously till the next chickens appear and then are relentlessly driven away; they cross to the nearby shore which they can do by walking at low tide, though swimming an equal distance is often done by wekas. Among the young have several times been black ones. I have recognised the progeny of our residents on the opposite shore, for instance, one black chick for some reason had a slight limp. I easily recognised him later and he had grown into a fine specimen. The two permanently attached to us for rations are a large cock bird and a small slim little hen. Referring to the fact that some and probably all mated wekas have three clutches of chicks per year and assuming that these bred next year the explanation of the quick increase of the weka is simple. July 3, 1951: The wekas at Bravo Island are at an interesting stage. The young ones have not yet been driven away, though the cock bird is paying amorous attention to his mate. The young ones, now fully grown, are sometimes by themselves —sometimes associated with the parents. In the latter case, their treatment by their father is erratic, as one moment he is feeding them and a second later attacking them savagely. I expect when the hen bird lays, or at any rate certainly when the chicks are hatched, these last season's young will be finally driven off the island.—R. H. Traill, Halfmoon Bay, Stewart Island.

RINGING OPERATIONS.

SUMMARY FOR THE YEAR ENDED 31st MARCH, 1951.

Compiled by J. M. Cunningham, Masterton.

The following statistical summary shows the number of birds reported ringed and recovered under the Society's scheme from its inception (the first bird ringed was a silvereye on February 27, 1950) to March 31, 1951, the end of the society's year. It includes a number of birds of various species outside the normal scope of the scheme, ringed by special permission of the Hon. Minister of Internal Affairs, and also some birds ringed with other than the society's rings, but details of which have been provided by the operators. No distinction is made in either case. The totals "all operators", by incorporating the totals published in Notornis, Volume 4, No. 4, thus include details of all ringing of which details are on the society's files. In order to make the information available as soon as possible, details are given of all recoveries made at the time of going to press. This number is, therefore, greater than the number shown in the summary, which is up to March 31 only.

BIRDS RINGED.

Operators. Where Ringed.	All Operators to 31/3/51 Ringed.	All Operators to 31/3/51 Recoverd.	Individual Operators 1950-51 Ringed.	Individual Operators 1950-51 Recov.
ALBATROSS—Light-mantled Sooty	23	9		
ALBATROSS—Royal	374	12		
ALBATROSS—Wandering	30	1		
R. A. Falla—Antipodes Island			10	
BLACKBIRD	73	6		
R. H. D. Stidolph—Masterton			4	
CHAFFINCH	4			
DOTTEREL—Banded	15			
J. M. Cunningham—Wairarapa			3	
R. H. D. Stidolph—Wairarapa			8	
DOTTEREL—New Zealand	3	1		
H. R. McKenzie—Mataitai, Clevedon			3	1
DUCK—Grey	1			
DUCK—Paradise	4			
J. M. Cunningham—Lord Howe Island			2	
FANTAIL—Pied	19.	3		
GANNET	169	2		
P. A. S. Stein, Horu Horu			27	
F. H. Robertson & K. A. Wodzicki, Cape Kidnappers			142	2
GODWIT—Bar-tailed	1			
GREENFINCH	10			
GULL—Black-backed	52	1		
J. M. Cunningham—Palliser Spit			40	1
L. Gurr—Nelson			1	
GULL—Black-billed	336			
E. W. Dawson, Ashley River, Canterbury			304	
GULL—Red-billed	214	6		
R. A. Falla—Day's Bay			1	
L. Gurr—Nelson			106	
J. H. Sutherland, The Brothers Island, Cook Strait			29	
HARRIER	12	1		
J. S. Watson—Hawke's Bay			12	1
HEDGE SPARROW	17			
R. H. D. Stidolph—Masterton			3	
KOKAKO—Blue-wattled	3			
H. R. McKenzie—Moumoukai			3	
MAGPIE—White-backed	1	1		
PETREL—Giant	1			
PETREL—Grey-faced	1			

BIRDS RINGED.—Continued

Operators.	Where Ringed.	All Operators to 31/3/51 Ringed.	All Operators to 31/3/51 Recoverd.	Individual Operators 1950-51 Ringed.	Individual Operators 1950-51 Recov.
	PHEASANT	710	197		
	PRION—Fairy	20			
	PUKEKO	2			
J. M. Cunningham—	Wairarapa			2	
	QUAIL—Californian	22			
G. R. Williams				22	
	SILVEREYE	4302	156		
J. M. Cunningham—	Masterton			1	
	SKUA—Southern	6			
	SPARROW—House	7			
	STARLING	30			
	TERN—Caspian	6			
	TERN—White-fronted	265	2		
L. Gurr—	Nelson			94	1
J. H. Sutherland, The Brothers				30	
	THRUSH—Song	38	4		
	WARBLER—Grey	16	1		
	Numbers Ringed, 1950/51			837	6
	Numbers Ringed to 31/3/50 (published Notornis, Vol. 4, No. 4)			5950	397
		6787	403	6787	403

RECOVERIES.

NEW ZEALAND DOTTEREL (Pluvierhynchus obscurus).

5902, colour-ringed as a chick aged 29 days at Mataitai, Clevedon, on 26/12/50, was seen at Karaka, Manakau Harbour, 6/2/51 and several dates up to 7/4/51.

5901, ringed one day earlier, was from the same nest as 5902, and was seen where ringed 5/4/51. The third chick from the clutch was not seen after the age of 46 days.

GANNET (Sula serrator).

15258, ringed as a chick 15/1/51 at Cape Kidnappers was recovered at Harrington Beach, 150 miles north of Sydney, Australia, 20/3/51, after heavy gales.

15275, ringed similarly, was found dead on Port Macquarie Beach, 190 miles north of Sydney, Australia, 22/3/51.

15291, ringed similarly, was recovered at Paekakariki Beach, 12/4/51, exhausted by gales. There were traces of oil on the feathers and the bird died.

15262, ringed similarly on 24/2/51 was found sick and died, at Kereta, Thames coast, 22/4/51.

BLACK-BACKED GULL (Larus dominicanus).

14124 was ringed on Palliser Spit, Wairarapa, as a fledgling, 1/1/51, and was found dead near the colony 12/3/51.

BLACK-BILLED GULL (Larus bulleri).

10287 was ringed as a chick 3/12/50 in the Ashley River, was found dead, partly eaten, in the Manawatu River, 8/5/51.

RED-BILLED GULL (Larus novaehollandiae).

9342 was ringed as a fledgling, 14/1/51 at Boulder Bank, Nelson. It was recovered 1/3/51 exhausted after a storm, presumably near Nelson, and released later without the ring.

9501 ringed similarly, 6/2/51, was found dead in Nelson 10/5/51.

9611 was ringed as a chick at The Brothers Island, Cook Strait, 3/1/51. It was found fouled in ropes on the deck of a boat in Tory Channel, 31/3/51, and was apparently released without the ring.

HARRIER (Circus approximans).

13102 was ringed in the nest, 3/1/51, at Hynish, Tikokino, Hawke's Bay. It was trapped less than a mile away, 10/6/51.

13107 ringed 19/3/51 as a yearling at Hynish, was found dead within a mile, 11/6/51.

13106 also ringed as a yearling at Hynish, 18/3/51, was recovered in a rabbit trap within four miles, 18/4/51.

13103 ringed at Hynish, 3/1/51, fully fledged, was recovered in a rabbit trap not far away, 24/2/51.

WHITE-FRONTED TERN (Sterna striata).

5926, ringed as a fledgling at Boulder Bank, Nelson, 14/1/51, was found dead on the beach near Onekaka, 76 miles north-west, 3/3/51.

GIANT PETREL (Macronectes giganteus).

16804 was ringed at Heard Island, 6/3/51, by members of the Australian National Antarctic Research Expedition, who are using O.S.N.Z. rings. The probable age of the bird when ringed was 2½ months, and it began flying in the middle of April. The bird took the bait of a hand-line from a fishing vessel about 200 miles south-west of Durban, South Africa, on 9/8/51. The hook was removed, ring number noted and the bird released without injury. The incident was reported by Mr. J. R. Malin, hon. secretary of the Natal Bird Club (branch of the South African Ornithological Society), Box 937, Durban. The recovery point is about 2400 miles from where ringed.

NOTICES TO MEMBERS.

Reprinting of Cyclostyled Issues.—The response of members who are prepared to buy these issues if published shows that there is a very general demand for them. However, not enough money has yet been promised to make the republication an economic proposition to the Society. All members who would buy a copy (probably priced at 10/-) or make a donation towards the cost are asked to advise the hon. secretary immediately if they have not already done so. Requests are often received for original copies of the cyclostyled issues. If any members have copies they no longer require, they are invited to inform the hon. secretary of the price they are prepared to sell them at.

Nest Records.—Members are urged to obtain a supply of cards for the present nesting season from Mr. J. King, whose address is now c/o Box 448, Masterton, and to fill in as many as possible.

Ringing Scheme.—Members intending to ring this season are urged to get their supply of rings early. A few pairs of pliers, suitable for closing rings are available from J. M. Cunningham. The size required should be stated, and the price is 12/6. Members finding birds washed up on beaches are asked to look for possible rings on the legs, as many seabirds have been ringed in the last year. Banded dotterel, New Zealand dotterel, pied and black stilts, red and black-billed gulls are being colour ringed this season, and a close watch should be kept for these, care being taken to note the colours, and on which legs the rings are on.

Beach Patrol.—A new investigation has been launched, in which all members having the opportunity of searching beaches for birds washed up after storms can take part. A Beach Patrol Card is available to give a list of species found, and a Specimen Record Card should be completed, giving details of every specimen found, whether preserved or not. Cards are obtainable from the organiser, J. M. Cunningham.

Society's Activities.—With this issue is enclosed a pamphlet setting out the objects and activities of the Society. Members will see that there are many ways in which they can help, and extra copies may be had from the hon. secretary for passing on to prospective members.

BIRDS SEEN ON A BANK'S PENINSULA TRAMP.—Starting on Thursday, January 12, 1950, and arriving home at Governor's Bay a week later, a friend and I tramped through the following Bank's Peninsula bays: Governor's Bay, Purau (via Lyttelton), Port Levy, Pigeon Bay, Decanter Bay, Little Akaloa, Okain's Bay, and from there by truck to Christchurch. The birds seen from the road during the tramp, with some species reported by residents, were:—Black-backed Gull: c. 150 on offal from Cass Bay Abattoir, Lyttelton Harbour; 5 at Purau Jetty; 2 immature birds at Port Levy; c. 20-30 immature and mature birds on the Decanter Rocks at Decanter Bay; occasionally seen about the road on both sides of the Hill Top. Red-billed Gull: Two on Little Okain's Bay beach. Black-billed Gull: Relatively common inside the Lyttelton moles; 7 at Port Levy and 1 at Little Okain's Bay. White-fronted Tern: c. 200-250 on Decanter Rocks at Decanter Bay; c. 300 on a small island near Okain's Bay jetty, their nesting site; four nests on the cliff above Okain's Bay Jetty Road. Black Shag: Three, Decanter Bay. Spotted Shag: Six, Decanter Bay and three Okain's Bay. White-flippered Penguin: Immature bird seen in mid-harbour; 25-30 nests about 15 yards above high-water level along coast between Okain's Bay and Little Okain's Bay. Many of these nests were overhung with the southern ice-plant **(Mesembryanthemum australe)**, and seven were still in use; two adult corpses on Pigeon Bay beach; one decapitated body in a cave, Okain's Bay. Kingfisher: Port Levy, three on shore, one in tidal creek-bed after crabs, and one nest on the usual clay bank, c. 30 yards above high-tide level; two on Okain's Bay river-flat. Harrier: Nearly always in sight. Native Pigeon: One seen on willow at Pigeon Bay. According to residents it is common about the houses, especially in winter. Pipit: Constantly seen throughout the trip in groups of 2 to 4 and sometimes more. Tui: Two heard in cultivated shrubbery, Purau; heard in orchard at Pigeon Bay. Bell Bird: Heard often at Purau and a recently-killed adult bird was found in a horse-trough there. A resident asserted that a magpie had killed it. Its head was badly battered. Three at Pigeon Bay eating ripe plums. Silver-eye: Relatively common at Pigeon Bay. Fantail: Both phases reported at Purau, but only one pied seen; four pied and one black in manuka scrub at Port Levy; relatively common at Pigeon and Okain's bays. Introduced species seen were:—Black Swan: Three on Lake Forsyth; pheasant, pair in blue gum plantation, Purau, and flying at Port Levy; Californian quail, a pair at Port Levy and frequently heard there and heard at Pigeon Bay; greenfinch, seven in Port Levy; chaffinch; redpoll, constantly seen in groups of up to five on the Purau side of the Purau-Port Levy saddle, but one pair only seen on Port Levy side, the exposed south slope; goldfinch, house sparrow, thrush and blackbird, present everywhere; skylark; starling; white-backed magpie, relatively common in Purau blue gums, one at Port Levy and heard at Okain's Bay.—Ian D. R. Cresswell, Christchurch.

GREY DUCK CARRYING YOUNG IN BILL FROM NEST TO TREE.—At Waiuku, on September 18, 1949, I saw a grey duck alight in a clump of astelia high up in an old puriri. The next day I investigated, a rope being necessary to reach the spot. There was no sign of the sitting bird then, at 3.15 p.m. The creamish-coloured eggs were covered over with down and a few odd pieces of bark, small twigs and leaves. After taking photographs of the nest and eggs, I carefully re-covered the eggs with a stick I had broken off so as not to touch them by human hand, as this may cause a sitting bird to desert. On September 27 I returned to see the adult bird descending into a patch of wiwi (rush) near the Awaroa canal, in the Aka-aka Swamp. Later it flew up and headed off in the direction of the patch of bush. At 2.20 p.m. I returned. The duck was on the ground, and huddled in front of her were three small ducklings. None of them seemed aware of my intrusion. Suddenly the old bird took off and flew for approximately 300 yards and alighted in the tree. I was fortunate enough to see how the grey duck conveyed its young to the ground from a tree top nest—in its bill, as a cat carries her kittens.—H. J. Chapman, Onehunga.

AGE GROUPS AND SEX RATIO OF THE CALIFORNIAN QUAIL IN CENTRAL OTAGO IN THE 1948-49-50 SHOOTING SEASONS.

By L. Gurr, Nelson.

The Californian quail **(Lophortyx californicus)** was first introduced into Otago in 1868 when the Otago Acclimatisation Society liberated 18 birds at Inch Clutha, Thomson (1922). They increased rapidly and spread throughout the province, reaching their greatest numbers in the late '80's of last century. Due to a combination of ecological factors they received a severe check in the early '90's, disappearing altogether from some localities, especially on the coast. They managed to survive, however, in Central Otago, where their numbers have remained fairly static to the present day except for season to season fluctuations. It was in an endeavour to measure the extent of these seasonal fluctuations that this work was undertaken.

Sumner (1935) conducted a life history study of the Californian quail in its native habitat in the Santa Cruz Mountains, California, and was able to work out a life equation for the quail in that area. He also indicated a simple method of distinguishing young of the year from fully adult birds. He states, "The innermost six primary coverts of the juvenile plumage are 'clay colour' barred and striped with buffy white, in which respect they differ from the fully adult plumage." (See Fig.) A cyclostyled questionnaire with a drawing of a wing of an adult and a juvenile bird illustrating the diagnostic features of the age groups was distributed to local shooters asking for the number of each sex and age group in their daily bag.

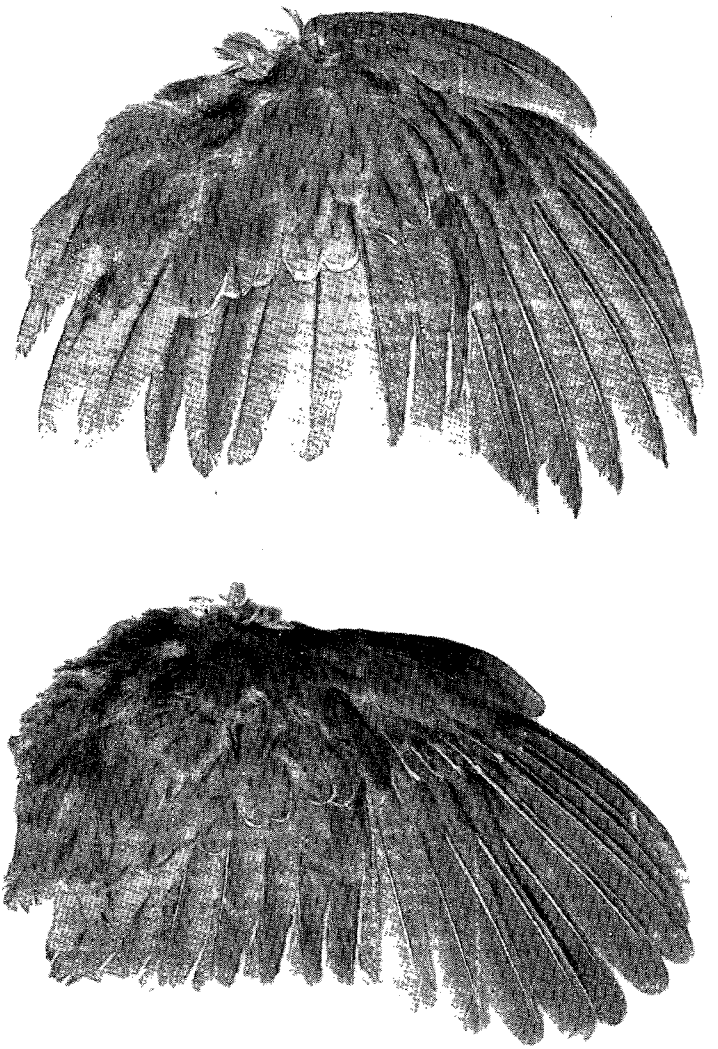
The number of questionnaires returned was disappointing—only three were returned in 1948, five in 1949 and one in 1950. In addition to these, questionnaires were supplied to the Internal Affairs Department, Wildlife Branch, at Queenstown, for distribution and they kindly supplied me with the results of several returned in 1949. In all, 896 birds were reported on, and all of these were taken in the shooting season (May, June, July of each year) in Central Otago.

TABLE I.—AGE GROUPS.

		% of Totals.	
Shooting Season.	No. in Sample.	Juveniles.	Adults.
1948	379	63	37
1949	310	54	46
1950	62	34	66

Table I. shows the percentage of the bags that were juveniles and comparison of the 1948 and 1949 shooting season indicate that a greater number of young birds were raised in the 1947-48 breeding season than in the 1948-49 season. The number in the 1950 shooting season sample is too small to be of any value in comparison with the previous seasons. It is, however, of interest as a special case. It consists of the bags from two adjacent coveys only. The first covey had been shot over regularly from season to season and yielded a bag of 27 birds, 52% juveniles to 48% adults, whilst the second covey had not been shot over in recent years and yielded a bag of 35 birds, 20% juveniles and 80% adults. Sumner (1935) in discussing permanency of covey states: "Although certain individuals of a given covey may fail to return in the following autumn the covey usually receives a sufficient number of new birds, most of which are young of the year, that its size remains fairly constant. In reality the numbers of a covey and its location are governed largely by the available food and shelter. . . ."

It would appear then that annual shooting had reduced the number in the first covey below the carrying capacity of that covey's range and thus room was made for young of the year to join in the following autumn. In the case of the unshot covey, natural mortality had made room for only a few birds of the year to join it in the autumn and the surplus young of the year were crowded out and had to join or form



Wing of Adult Quail (above) and of Immature Quail, less than one year old (below). Note the buffy white tips and barring of the primary wing coverts of the immature and the complete absence of this colouring on the primary wing coverts of the adult.

other coveys; hence the high percentage of adults in the unshot covey. This then indicates that shooting exerts a pressure on the numbers of quail in Central Otago. Sumner (1935) has shown from population fluctuations during one year among quail residing in a 60-acre territory that juveniles constituted approximately 70% of the population throughout the year. From this he concludes, ". . . it can be seen that if the percentage of young birds taken is consistently less than about 71% of the total bag, it is an indication that the breeding season was not successful." In several individual coveys reported on, more than 70% were juveniles, but the overall percentage in both 1948 and 1949 fell short of this. (See Table I.) Until more is known of local conditions and replacement rates of quail in Central Otago it cannot be said that overshooting is taking place, but when the percentage of juveniles is in the low 50's caution is indicated.

TABLE II.

	Percentage of Totals.		
	Males.	Females.	No. Birds in Sample.
1948	55	45	331
1949	58	42	503
1950	53	47	62

The sex ratios for the three years (see Table II.) were consistently in favour of the males, and for the three seasons combined, 896 birds, the ratio was 57% males to 43% females. Sumner (1935) obtained a ratio of 53.2% males to 46.8% females.

I wish to acknowledge my indebtedness to the Otago Acclimatisation Society for printing and distributing the questionnaires and especially to Mr. L. Miller and Mr. W. N. Manson, the secretary and ranger respectively, for their ready assistance throughout. To the shooters who returned completed questionnaires, to Mr. E. S. Gourlay, who obtained the quail wings for me, and to Mr. R. Blick, who photographed them, I am grateful.

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Sumner, Jr., E. Lowell (1935)—A Life History Study of the California Quail, with Recommendations for Conservation and Management. California Fish and Game, vol. 21, Nos. 3 and 4, pp. 168-256 and 277-342.

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FEEDING OF SILVER-EYE CHICKS.—When young silver-eyes were under observation the parent bird always brought three insects and fed one to each of the three chicks. Thus they all received an equal share every time the parent bird returned to the nest with food.—Noelle Macdonald, Howick.

FLIPPER PATTERN OF LITTLE BLUE PENGUIN IN COOK STRAIT.—According to reference works, the flipper of the little blue penguin is banded behind with one row of white feathers. This character appears in photographs taken of little blue penguins on Otago Peninsula, on the Five Islands, New South Wales, and in Western Australia. In Cook Strait it is usual for adult blue penguins to have anterior as well as posterior bands of white feathers on the flippers. The anterior band often becomes more extensive on the carpal flexure. Of 15 adult penguins collected as derelicts at Oharui Bay and Lyall Bay, Wellington, between 1946 and 1950, two only had a single band of white feathers on the posterior edge of the flippers. The culmens of single banded birds averaged 38mm. length, of double banded birds 36mm. length. Wing lengths of both varieties averaged 65mm. As regards juvenile birds, which are cast ashore in great numbers following the summer solstice, these have no anterior band to the flippers. Future work may serve to show whether the characters described have any taxonomic significance. —H. L. Secker, Wellington.

BIRD NOTES FROM STEWART ISLAND.

By E. W. Dawson, Christchurch.

During late January and early February of 1951, I spent about three weeks traversing the northern part of Stewart Island, in company with Mr. R. G. Frean, of Christchurch, to whom my thanks are due for allowing me to turn a deer-stalking holiday into an ornithological trip of some interest. The following account is compiled from our joint observations during that time:—

Kiwi **(Apteryx australis)**.—At night, calls were heard frequently in the bush in certain areas; North Arm, Paterson Inlet, 19/1/51; along the Freshwater River, 20/1/51; on the slopes of Mt. Rakiahua, south-east of Island Hill, and all along the slopes of Rakiahua to the hut at the Rakiahua River. Kiwi beak prod marks were seen in the swampy areas in the manuka scrub beside this hut. During our stay here (eight days), kiwis were very noisy in the bush at night.

Giant Petrel **(Macronectes giganteus)**.—One was seen during the crossing between Bluff and Stewart Island.

Mutton Bird **(Puffinus griseus)**.—Numbers followed the ship on the crossings. At Mason Bay, calls were heard late at night on several occasions.

Mollymawks **(Thalassarche spp.)**—Three mollymawks were seen from the ship during the crossing. One of these was a shy mollymawk **(T. cauta)**, but it was not possible to tell whether it was **(T. cauta steadi)**, the large form, or the other shy mollymawk with the grey neck, the robust form of **T. cauta salvini.** Twenty unidentified mollymawks were seen off Ringaringa Beach and about 200 others were seen in Halfmoon Bay (4/2/51). Of these, only about half-a-dozen were seen closely, and appeared to be shy mollymawks. An immature shy mollymawk was seen on the return trip to Bluff.

Pied Shag **(Phalacrocorax varius)**.—One seen flying over the North Arm, 19/1/51; 6, Mason Bay, 22/1/51; 2, mudflats, South-west Arm (Caerhowel) of Paterson Inlet; 4, at mouth of Rakiahua River, 2/2/51; 4, on rocks between South-west Arm and Abraham's Bay, Paterson Inlet, 3/2/51.

White-throated Shag **(P. melanoleucos)**—A completely black bird was seen up the Rakiahua River near the hut, 27-30/1/51. At the mouth of this river were 13 birds in various phases of plumage, 2/2/51.

Stewart Island Shag **(Leucocarbo c. chalconotus)**.—A few "Stewart Island" forms were seen during the crossing from Bluff. Both the "Stewart Island" and "bronze" forms were seen on rocks in Halfmoon Bay. Between the South-west Arm and Abraham's Bay, seven "bronze" were seen. Lonneker's Rock was virtually covered with the "bronze" on 5/2/51.

Blue Shag **(Stictocarbo punctatus steadi)**.—A number seen on rocks in Halfmoon Bay on our arrival, 19/1/51. Between the South-west Arm and Golden Bay, four, 2/2/51.

Grey Duck **(Anas poicilorhyncha)**.—Ten at the mouth of the Rakiahua River on mudflats (R.G.F., 31/1/51) and later, a flight of 45 near the same place (E.W.D., 2/2/51).

Canada Goose **(Branta canadensis)**.—Ten near Duck Creek, Mason Bay, 23/1/51.

Harrier **(Circus approximans)**.—Seen on several occasions.

Weka **(Gallirallus australis)**.—Weka calls were heard frequently at night in the Rakiahua Valley. Three birds were often seen within a few yards of the hut door and fed on our scraps. One of them was slightly darker than the others (which appeared to be typical **G. australis)** but not so dark as that described by Ogilvie-Grant as **Ocydromus scotti.** There seemed to be only two or three pairs in the vicinity, in spite of the loud and numerous calls at night.

Black Oystercatcher (**Haematopus unicolor**).—At Mason Bay, this bird was common and apparently breeding. Six mature birds with a very large downy chick were seen (22/1/51) and next day, along one mile of beach, 17 were counted. Three very small chicks were seen with a group of mature birds, 24/1/51. Near Halfmoon Bay, one was seen on Ringaringa Beach and another at Golden Bay. A group of 10 was seen at the mouth of the Rakiahua River, 3/2/51.

Banded Dotterel (**Charadrius bicinctus**).—Seven birds were seen in the sandhills at Duck Creek, Mason Bay. Four of these were typical males. Later, 16 birds were counted in the same area.

N.Z. Dotterel (**Pluviorhynchus obscurus**).—Ten were seen at Mason Bay on one occasion, one of these accompanying a very small chick. On another occasion about eight pairs were seen with a number of juveniles.

Black-fronted Tern (**Chlidonias albistriata**).—One was seen off Cone Island, Paterson Inlet, 3/2/51.

White-fronted Tern (**Sterna striata**).—One seen at Mason Bay on 24/1/51. About 12 in Halfmoon Bay and three on Ringaringa Beach, 4/2/51.

Black-backed Gull (**Larus dominicanus**).—Six or eight gulls followed the ship across from Bluff and also on the return trip. Common on Mason Bay Beach, between 40 and 50 within a mile or two. Mature birds were seen feeding on soles washed up in the surf. Gulls were numerous on the mudflats in the South-west Arm and odd birds were seen up the Rakiahua River. This gull was common in Paterson Inlet and over 50 birds were counted in the vicinity of H.M.S. Lachlan which was at anchor near the Island of Ulva, 3/2/51. A rough count showed about 50 birds on the rocks near the main wharf in Halfmoon Bay with c. 100 on the wharf itself.

Red-billed Gull (**L. novaehollandiae**).—Found commonly at Halfmoon Bay. At Mason Bay only three gulls were seen, 22-23/1/51. In the South-west Arm very few, varying daily from one to three. About 50 were noted on a small rock between Iona and Golden Bay, in Paterson Inlet. Three were seen on Ringaringa Beach.

Pigeon (**Hemiphaga novaeseelandiae**).—We saw relatively few; one at Leask's Bay; one at Mason Bay; one in bush north of Walker's Hill; one in the Rakiahua Valley, and several in the bush near the mouth of the Rakiahua River. This bird was quite common in the bush between Halfmoon Bay and Ringaringa and a flight of six was seen going across Paterson Inlet to Ulva.

Kaka (**Nestor meridionalis**).—Five were seen between Halfmoon Bay and the North Arm and others were heard near the Freshwater River. Kakas were also heard on the lower slopes of Mt. Rakiahua. The kaka seems to be spreading rapidly to the settled areas of the island.

Parakeets (**Cyanoramphus spp.**).—Calls were heard frequently in the bush between Halfmoon Bay and the North Arm; five were seen together. Calls were numerous at the Freshwater River hut. Other calls were heard in bush bordering Mason Bay and in the forested slopes of Mt. Rakiahua. Two red-fronted parakeets (**C. novaeseelandiae**) were seen in the bush bordering the Rakiahua River. Parakeets were often seen high above the trees of the bush at the mouth of the river but identification was impossible. Mr. A. W. Traill informed me that, generally speaking, the red-fronted parakeet was commoner on the main island than the yellow-fronted (**C. auriceps**). The latter is, according to him, commoner on the off-shore islands.

Shining Cuckoo (**Chalcites lucidus**).—One seen in macrocarpa trees at Ringaringa Point, 5/2/51.

Long-tailed Cuckoo (**Eudynamis taitensis**).—One chased by a tui on the manuka-covered Freshwater River plains. Occasional calls were heard in the forested slopes of Mt. Rakiahua but every day calls were frequent in a group of macrocarpa trees and from the surrounding

expanse of manuka at the Rakiahua Hut. Calls were also heard in Halfmoon Bay.

Morepork (**Ninox novaeseelandiae**).—Calls were heard at dusk between Halfmoon Bay and the North Arm and along the Freshwater River; from the bush at the north end of Mason Bay; and from the bush above the Rakiahua Valley.

Kingfisher (**Halcyon sanctus**).—One on the Rakiahua River near the hut; another on Cone Island, Paterson Inlet.

Rifleman (**Acanthisitta chloris**).—Two were seen at Ringaringa Point by R.G.F. and Mr. A. W. Traill.

Bush Wren (**Xenicus longipes**).—A bird which was almost certainly this species was seen between Deep Bay and Ringaringa by R. G. F. and myself, with Mr. A. W. Traill, who told us that he had not seen any wrens on the main island for many years but now, within recent years, he had seen an increasing number, similar to those on Kotiwhenu.

Pipit (**Anthus novaeseelandiae**).—Two near the Gorge Hut, Freshwater River plains. In manuka scrub and grass behind Mason Bay, pipits were seen commonly.

Fern Bird (**Bowdleria punctata**).—Several were seen and others heard at the Gorge Hut, 21/1/51. Mr. Traill told us that it was quite common in most of the areas of manuka scrub, particularly in the Freshwater River plain and the Rakiahua Valley.

Grey Warbler (**Pseudogerygone igata**).—Commonly seen and heard in the bush between Halfmoon Bay and the North Arm of Paterson Inlet.

Yellow-breasted Tit (**Petroica m. macrocephala**).—Four males and a female seen between Halfmoon Bay and the hut at the Freshwater River, where three females and another male were seen. The intensity of breast colour in the males was much lighter than in any I have seen in South Island birds in the field, at this or any other time of the year. These males and all others seen during this trip appeared white-breasted in the field and were very similar to the pied tit (**P. m. toitoi**).. Some of this paleness may be due, as C. A. Fleming states (T.R.S.N.Z., 78:30) to age and to seasonal fading. Residents of Stewart Island say that the normal forms with a yellow breast are seen commonly there but at what seasons of the year we were unable to find out. Three pairs of tits, with pale-breasted males, were seen in bush on the lower slopes of Mt. Rakiahua, 24/1/51. About six similar males were seen at various places in the bush along the Rakiahua River. Even in the bush above Ringaringa Beach, we saw a pair, the male of which was white-breasted, 4/2/51.

Stewart Island Robin (**Petroica (Miro) australis rakiura**).—Confirmation of C. A. Fleming's "weak" subspecies, recently proposed by him (T.R.S.N.Z., 78:141-143) was given in the field by our independent observations on this form. To us, the bird seemed smaller than the typical South Island form, the back of the male seemed darker and the breast was more of a "dirty white." Two males and a female were seen at the Freshwater River hut, 21/1/51, while a pair or two were always in and about the hut at the Rakiahua River, where we were for eight days. A bird would sometimes fly down the chimney while we were cooking on the fire, its "dirty white" breast and dark back being even more noticeable then! A few pairs could usually be found in the bush along the Rakiahua River.

Brown Creeper (**Finschia novaeseelandiae**).—The peculiar trilling call was constantly heard around the Rakiahua Hut as smalll flocks (6 to 8 birds) flew through the manuka scrub in the sunshine.

White-eye (**Zosterops lateralis**).—Four seen in the bush between Halfmoon Bay and Ringaringa, feeding on **Coprosma** berries. Residents told us that the birds had developed a great liking for picking at venison hung from trees in the settled areas.

Tui (**Prosthemadera novaeseelandiae**).—Tuis were seen very commonly during our trip in all parts of the heavy bush in which we were.

They also were common in the manuka scrub of the Freshwater River plain and in the **Olearia** groves in the sandhills at Mason Bay. They were very noticeable around the hut at the Rakiahua River, indulging in vigorous song, especially on one particular evening before a day of intermittent rain and dull conditions when the quiet of the night was made cacaphonus with the continual calling of tuis, robins, kiwis, wekas, moreporks, etc. Tuis were also commonly seen during a few hours spent on Cone Island in Paterson Inlet. They were a common sight in the bush above Halfmoon Bay and must surely be the most ubiquitous birds on Stewart Island.

Bell Bird **(Anthornis melanura)**.—As ubiquitous as the tui but seemed slightly less abundant.

Greenfinch **(Chloris chloris)**.—Two seen in the manuka covered plain near Island Hill, Mason Bay, 22/1/51.

Goldfinch **(Carduelis carduelis)**.—Two seen in the bush above Halfmoon Bay, 5/2/51.

Sparrow **(Passer domesticus)**.—Several in the groves of **Olearia** near Martin's Creek, Mason Bay; others near Ringaringa Beach in macrocarpa trees.

Yellowhammer **(Emberiza citrinella)**.—Two seen near Martin's Creek, Mason Bay, 23/1/51.

Thrush **(Turdus ericetorum)**.—Several above Ringaringa Beach.

Blackbird **(T. merula)**.—Heard in the bush between Halfmoon Bay and Ringaringa.

Hedge Sparrow **(Prunella modularis)**.—One was seen at Duck Creek, Mason Bay.

Stewart Island presents an interesting area for the ornithologist, and it is to be hoped that a more comprehensive account of the bird life, based on Dr. W. R. B. Oliver's work of 1926, will be made when details of the effects of such predators as deer and cats on the plant and bird life become available.

DUNEDIN NATURALISTS' FIELD CLUB NOTES.

By (Mrs.) I. Tily, recorder.

References to the bird life of Stewart Island when a party of members from the Dunedin Naturalists' Field Club spent a week at Oban, Stewart Island, from January 18-25, 1950, appear below:—

Kiwi.—One paid a brief, unwilling, visit to the hotel garden in a box on its way from Mason Bay to the Ulva Island Scenic Reserve and Bird Sanctuary, where it was to be released.

Little Blue Penguin **(Endyptula minor)**.—We had a calm passage across to the Island and numbers of these birds were seen in Foveaux Strait. The return trip was rough, and only two or three were noted. On launch trips we never failed to see this penguin swimming and diving about the coast and in Paterson Inlet. On a long launch trip from Halfmoon Bay to The Neck and up Paterson Inlet, the numbers seen would be anything from 50 to 80.

Cape Pigeon **(Daption capensis)**.—Definitely recorded only once.

Giant Petrel.—Seen in flight while at the Island and during a stormy homeward passage several were recorded.

Mutton Birds.—Present in Foveaux Strait in numbers on January 18th; on the return journey not noted until we entered more sheltered waters in the lee of Bluff Hill. They were also seen on launch trips.

Albatrosses were seen in numbers on launch trips, but not always near enough for identification. The following were identified on coastal launch trips: Buller's mollymawk **(Thalassarche bulleri)** and white-capped mollymawk **(T. cauta)**.

Shags were numerous. We identified the following: Black shag **(Phalacrocorax carbo)**, pied shag and white-throated shags, Stewart Island and bronze shags, blue shag.

Black Swan **(Cygnus atratus)**.—One on the waterfront at Oban; it was quite tame and allowed us to stroke it.

South Island Weka.—Seen in numbers up to five at a time. It was more frequently seen at Ulva than on the main island. At West End, Ulva, two parent birds and three young fed on the beach.

Black Oystercatchers.—At Bravo, 22 were on the beach. When they took to wing no white was seen about the plumage. Pairs were seen on the following beaches: Ocean Beach, Port Williams, Sawyer's Bay, Lee's Bay and West End Beach, Ulva.

White-fronted Tern.—Plentiful about Stewart Island. On launch trips it was usual to see a flock of about 20 on the rocks at Acker's Point.

Black-backed Gulls.—Seen daily.

Red-billed Gulls.—Much more numerous than the black-backed gulls. When on the last morning a bag of bread carried for the birds was emptied on the foreshore in front of the school, almost at once 100 to 150 gulls appeared.

Pigeon.—Very numerous. It was frequently seen in flight about trees in the township, and on a walk through the bush over 15 were counted. A resident said she had counted as many as 40 from her garden.

Kaka.—Kakas were heard more often than seen. On January 23, on Ulva, five were seen and calls were heard in other localities on the island. One bird was so busy prising the bark off a macrocarpa tree it did not bother about six pairs of curious eyes watching it at work about 10ft. from its scene of action. It used its strong bill like a pair of pliers to force back the bark; then it ran its bill up and down between the bark and the trunk of the tree. Then again it would seize the bark in its bill and prise it further back.

Parakeet.—A flock of about ten was seen near the landing at Ulva. Those that were close enough for identification were red-fronted parakeets. Others were seen or heard on the main island and in other localities on Ulva.

Shining Cuckoo.—Heard only once.

Long-tailed Cuckoo.—Heard daily. A pair seemed to divide their time between the trees about the hotel where we were staying and the trees near the wharf. They would be seen in flight, sometimes one, sometimes two, between these two localities. Calls were commonly heard on daily excursions. On one occasion a tui was seen to attack a long-tailed cuckoo.

Morepork.—Heard calling at night.

Kingfisher.—One seen at the landing, Miller's Bay, North-west Arm.

Rifleman.—One seen.

Bush Wren **(Xenicus longipes)**.—Three or four noted.

Grey Warbler.—Songs heard daily and an occasional bird seen.

Yellow-breasted Tit.—Often seen and heard.

Fantail **(Rhipidura fuliginosa)**.—In small numbers only, probably no more than a total of 10 being seen during the week. Of these only one black was noted.

Brown Creeper.—Judging by the calls and songs heard, this is a very common bird, especially on Ulva.

White-eye.—Seen and heard frequently in small numbers.

Tui.—Seen darting about in numbers up to 6 or 7 at a time. On Ulva we saw two very young birds that appeared to have just left the nest.

Bellbird.—A common bird.

Introduced birds heard or seen were the chaffinch **(Fringilla coelebs)** still singing though songs had ceased in Dunedin; redpolls **(Cardeulis cabaret)**, goldfinches, sparrows, thrushes, blackbirds and hedge sparrows, the last three still in song though daytime songs of these birds had also ceased in Dunedin, occasional morning or evening songs being heard.

FURTHER NOTES ON THE CHUKAR.

By G. R. Williams, Wildlife Service, Department of Internal Affairs.

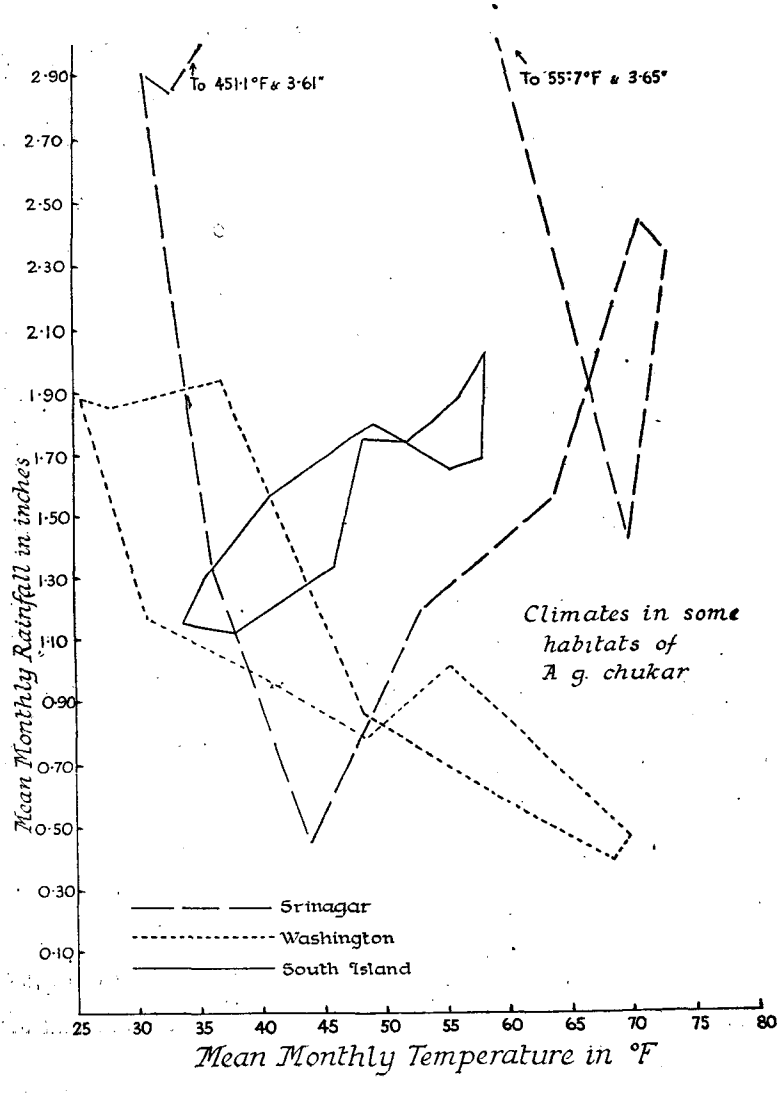
> "Tradition says the apostle St. John in his old age played with a red partridge of the same species as ours, **Alectoris graeca,** which he had brought up and loved very much."—(Abbe David's Diary.)

In a previous paper (Williams 1950) an account was given of the history of the introduction and the subsequent establishment and spread of the chukar **(Alectoris graeca chukar,** and, perhaps **A. g. koroviakovi)** in New Zealand. Since then records of two more introductions have been found: In 1933, among the many liberations made by the North Canterbury Acclimatization Society in that year, was one of twenty-six birds in the Clarence River Reserve, Marlborough. This brings the total number of liberations in the South Island to eighteen. In late 1950 thirteen chukar captured in Central Otago and Marlborough were set free at Manaia, on the Coromandel Peninsula, in the North Island. This was the second liberation at Manaia and the third for the North Island.

Chukar are still extending their range in the South Island. During a recent quail survey made in Blenheim and Marlborough it was learned that the birds have been reported on a number of occasions in Nelson Province. They were first noticed there between mid-1949 and mid-1950 in the Lake Rotoiti area along the tops of the St. Arnaud Range which here stand about 5,000 feet high. One report states that a covey of about forty were seen on the summit of Mount Robert. Another account mentions that some birds were sighted on the tops of the ranges near the headwaters of the Wangapeka River—another thirty miles to the north-east. These reports are of particular interest as most of the high country in Nelson is in an area where the rainfall varies from fifty to eighty inches a year, which is higher than is usual in most of New Zealand's chukar country.

With good numbers of chukar near at hand it is to be expected that occasional flocks will be seen in Nelson. In the United States this tendency to wide dispersal has been blamed as one of the main causes of the failure to establish the species there. (Nagel 1945, Moreland 1950.)

In Marlborough chukar are now known on the Blairich Range on the southern side of the Wairau River and they apparently approach to within ten miles in a direct airline from Blenheim on this side. The range is tussock covered for the most part and bears a strong resemblance to some of the best class of hill country in Central Otago. Chukar are rare or absent on the tops of the ranges on the northern side of the Wairau—here the rainfall is generally above fifty inches a year and the lower vegetation on the mountainsides passes from either beech **(Nothofagus)** forest or second-growth to sub-alpine scrub. On the Molesworth Station block the birds are reported to be very numerous. Here, at an altitude of about 3,000 feet, is terrain that closely resembles that of some parts of Central Otago. However, the temperature is lower and the rainfall higher—being 46.1 deg. F. and 26.45 inches annually, in comparison with 50 deg. F. and about 20 inches. (Garnier 1950 and Bulletin No. 2 of the Soil Conservation and Rivers Control Council 1944.) In the State of Washington (perhaps the only large area of the U.S.A. in which chukar are satisfactorily established) the terrain seems very like that of part of Otago and Marlborough but the climate is rather more severe than any in the New Zealand habitats—in winter deep snow and temperatures as low as 30 deg. F. below zero can occur and in summer temperatures as high as 115 deg. F. are recorded; but the mean temperature is about 50 deg. F. and the rainfall is between 15 and 20 inches annually. (Moreland 1950.) Climographs have been prepared (plotting mean monthly rainfall against mean monthly temperature) which show the differences in climate between the habitats of the Himalayan subspecies **(A. g. chukar)** in part of its home range and in the new ranges of Washington State, U.S.A., and the South Island of New Zealand. Although


To 45·1·1°F & 3·61"
To 55·7°F & 3·65"
2·90
2·70
2·50
2·30
2·10
1·90
1·70
1·50
1·30
1·10
0·90
0·70
0·50
0·30
0·10
Mean Monthly Rainfall in inches
Srinagar
Washington
South Island
Climates in some habitats of A g. chukar
25
30
35
40
45
50
55
60
65
70
75
80
Mean Monthly Temperature in °F

such graphs are always rather approximate—their accuracy increasing with the author's intimate knowledge of the areas concerned and the number of weather station records available—the general picture is probably true enough: In Washington the winters are very cold and wetter than the hot summers whereas in the South Island chukar country the winters are drier than the summers and the temperature differences throughout the year are not so extreme. When both these climates are compared with that of Srinagar in Kashmir (the only weather station within the main range of **A. g. chukar** for which full records are published; data from stations further east in northern India are complicated by the occurrence of the monsoon) it is clear that the New Zealand climate more closely than that of Washington State resembles this part of the home range of the species. A climograph prepared for the home range of **A. g. koroviakovi** but not included in the diagram for the sake of greater clarity, shows that Baluchistan more closely resembles Washington climatically than does Srinagar or the South Island. This suggests in turn that the Persian subspecies may be better suited than the Himalayan for north-west American conditions.

WEATHER RECORDS FOR BALUCHISTAN.

RAINFALL (in inches)

Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1.69	1.80	1.36	0.74	0.26	0.14	0.47	0.28	0.05	0.10	0.23	0.97

TEMPERATURE (in deg. F.).

Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
37.1	41.5	48.7	57.8	66.6	74.2	77.8	75.2	66.5	56.1	47.2	40.7

The South Island climograph has been constructed by taking the average of the records of the following six stations: Alexandra, Manorburn, Ophir, Roxburgh, Earnscleugh (all of Central Otago and within the range of the species) and Molesworth (in Marlborough).

The Washington climograph has been constructed similarly from the records of these six stations: Moxee, Omak, Hatton, Cle Elum, Waterville and Odessa. (Marvin 1926.)

The Srinagar records were obtained from Kendrew (1942) and the Memoirs of the Indian Meteorological Department (1947) and the Baluchistan climograph was constructed from the latter and Clayton (1934 and 1951) using the records from Quetta and Kalat.

POPULATION DENSITY.—As far as is known, nowhere in New Zealand does the normal chukar density of population approach even closely to a figure of one bird per acre. In the present absence of more accurate figures an estimate of ten birds per 150 acres may be regarded as something of the right order in the best country. This estimate is based upon relative abundance of Californian quail and chukar occupying the same area. Nagel states (op. cit.) that at the end of a two-year stocking programme in Missouri the average population density of released birds on the eight active areas concerned was one per seven acres; but when liberations were discontinued this artificially-maintained density soon fell away and chukar subsequently failed in that State. Moreland (op. cit.), discussing the distribution of chukar in Washington—where the species is apparently well-established and liberations have ceased—found a population density of about one bird to twenty-three acres over a range of sixty-one square miles. Under the circumstances this is likely to be a fairly natural state of affairs.

WEIGHTS AND MEASUREMENTS.—As stated previously, there may be more than one subspecies of **Alectoris graeca** in the South Island. In order to check whether this is so it will be necessary—among other things—to obtain and compare a series of measurements taken from birds inhabiting Central Otago (where **A. g. chukar** is presumed to be the species) with a similar set obtained from Marlborough (where **A. g. koroviakovi)** is suspected to occur). Figures calculated from an at-

present small number of Marlborough birds taken in June, 1951, are quite in conformity with this supposition of two races being present in New Zealand—the means of the measurements of each of the criteria listed below are consistently smaller in both sexes than the corresponding values for the Otago specimens, and these differences are in the required direction. Confirmation must await the obtaining of a larger number of specimens from Marlborough and a careful comparison of the plumages of the two populations. In the following table figures from the Otago population are set down. In the absence of any fully reliable method for distinguishing immature from adult chukar in the field by using plumage differences alone, only sex differences have been compared. As two chukar with spurs on the tarsi have been found on dissection to be females (this possibility was suggested by the various body measurements) this method of sex determination on sight may be regarded as not being as reliable as previously thought.

	Sex	No. of Observations.	Range	Mean	Coeff. of Variation.	Standard Deviation	S.E. of Mean
WEIGHT	Male	19	0.510–0.794kg.	0.638kg.	12.03	0.073	0.017
	Female	20	0.454–0.680kg.	0.540kg.	10.44	0.056	0.013
CULMEN	Male	19	2.10–2.35cm.	2.25cm.	2.73	0.061	0.014
	Female	19	1.90–2.40cm.	2.10cm.	5.36	0.113	0.026
TARSUS	Male	19	5.00–5.80cm	5.45cm.	4.04	0.210	0.048
	Female	19	4.50–5.60cm.	5.00cm.	4.66	0.221	0.051
MID-TOE & CLAW	Male	18	4.30–5.10cm.	4.80cm.	4.46	0.205	0.048
	Female	17	4.30–4.80cm.	4.55cm.	3.94	0.186	0.043
WING	Male	19	15.6–17.6cm.	16.6cm.	3.23	5.67	1.301
	Female	19	15.3–16.6cm.	15.8cm.	2.29	2.36	0.541

Measurements were carried out as suggested in Gurr's paper (1947). The following comments are necessary: In the table "culmen" means "chord of the exposed culmen," "tarsus" means "diagonal of the tarsus," and "wing" means "chord of the closed wing."

Simple statistical analysis shows that all the differences between the sexes for each of the above characteristics are significant. In other words, male chukar are reliably and distinctly bigger than females in most external organs usually measured and, at this time of year at least, they are also heavier. (The specimens were taken in July, 1950.)

The mean weight in Central Otago for chukar in winter taking the two sexes together was 0.58 kilograms (20.6ozs.). Moreland found a mean winter weight of chukar of both sexes in the State of Washington to be 0.52 kilograms or 18.2oz. The difference between the two seems great enough to be significant. This is rather interesting because the two populations (as far as is known) belong to the same subspecies—**Alectoris g. chukar**—and occupy similar habitats so far as mean annual temperature and mean annual rainfall are concerned, so the possibility of Bergmann's Rule operating can be virtually ruled out. However, winter in 45 deg. N. on the American continent is more severe than winter in 45 deg. S. in New Zealand so that Washington birds may show the effects of a seasonal food shortage at this time of year. The very fact that chukar can become established and extend their range under these rigorous conditions suggest that neither winter food shortage nor winter climate is likely to be a limiting factor in this country.

FOOD.—The feeding behaviour of chukar is similar in its rhythm to that of the Californian quail—activity being at its minimum in the middle of the day and at its maximum near dusk. The diet throughout the year seems to be composed of almost equal amounts of seeds and shoots—a small amount of insect material is also found. Remains of the following plants have so far been identified from crop contents:—

Items present.	Systematic name.	Type of Plant.	Availability
Scarlet pimpernel—seeds	**Anagallis arvensis**	Herb	E2
Thistle—seeds	**Cirsium sp.**	Herb	A1
Common coprosma—seeds			
,, ,, leaves	**Coprosma propinqua**	Shrub	A2
Hawkweed—flowerheads			
,, leaves	**Crepis capillaris**	Herb	A1
Matagouri—seeds			
,, leaves	**Discaria toumatou**	Shrub	A2
Milkweed—seeds	**Euphorbia peplus**	Herb	A1
Yorkshire fog—leaves	**Holcus lanatus**	Grass	A1
Hymenanthera—seeds	**Hymenanthera alpina**	Shrub	A2
Pohuehue—seeds			
,, leaves	**Muehlenbeckia complexa**	Creeper	D1
Kentucky bluegrass—leaves	**Poa praetensis**	Grass	A2
Tussock—seeds	**Poa caespitosa** (?)	Grass	A1
Sweet briar—seeds	**Rosa eglanteria**	Shrub	A1
White clover—leaves	**Trifolium repens**	Herb	A1
Nettle—leaves	**Urtica sp.**	Herb	D1
Vetch—seeds	**Vicia sp**	Herb	E2

In addition to all these there is much grassy material and seeds still to be identified and it has been reliably reported that the birds eat chickweed **(Cerastium sp.** A1) and clover seed.

In the table above availability has been indicated according to the following scheme:—

A—widely spread throughout the year
B—locally throughout the year.
E—locally six months of the year.
1—abundant.
2—not common.

Results essentially similar to these have been recorded by Nagel and Moreland but naturally the food resources are rather different in the U.S.A. The most important foods throughout the seasons studied in Washington were cheatgrass (downy chess), seeds, grass leaves and wheat; and in Missouri seeds of ragweed, Korean lespedeza, foxtail and leaves of grasses were the most common items. Downy chess **(Bromus tectorum)** is plentiful in the Mackenzie Country and Central Otago, and foxtail **(Alopecurus sp.)** is locally common in both islands (Allen 1940) but neither has been found in the crops so far examined in New Zealand.

To the question: "What damage are these birds likely to do to the plant cover?" one can say only this:—At their present population density it does not seem that chukar could noticeably modify the vegetation in those areas where they occur—the total food intake per bird each 24 hours (using Sumner's figures for quail as a basis for estimation) is probably about two ounces. Even assuming that chukar population was as high as one bird per acre (which is a very high figure indeed and perhaps at least ten times greater than that actually occurring) it is clear that each bird would be destroying a very small proportion of the total seed matter in the area it was occupying. Further, because of their characteristic scratching habits, chukar—and quail—while feeding, cover up at least as much ground as they uncover. Thus, one could say with some truth, that by removing excess seeds and covering up those that remain chukar are carrying out a useful, rather than a harmful, function. Sumner in his study of the life-history of the Californian quail (1935) found that quail confined for at least a year in an area such that the population density therein was as high as about 80 birds to the acre did not in any marked way affect the original plant association: On their removal it soon returned to its previous luxuriance.

Occasionally both quail and chukar do acquire the habit of invading newly-sown grain fields for their evening meal. This generally happens

when these fields are near to natural cover. There have been reports in the Press that chukar uproot tussock on the Otago hill country. The author has not so far seen this happen, and it would be very difficult to distinguish such damage (if, in fact, it does occur) from that caused by rabbits occupying the same area. It is hoped that as the chukar food investigation proceeds it will be possible to speak with more assurance on this controversial subject. A quantitative study of the food habits is at present in progress.

TRAPPING.—Nearly all attempts that have been made to trap chukar in New Zealand have failed conspicuously. Heretofore such lack of success has been hard to explain as the birds are apparently caught with ease in India; and Christensen (in a private communication 1950) states that "in areas of Washington where the chukar are heavily concentrated Coleman has captured as many as a thousand birds in two months, using only one man in the field. However there are occasions in less concentrated areas where the catch would not exceed 150-200 chukar partridges over the same period of time." Even the lower figure would be considered a very satisfactory result in this country.

However, both Nagel and Moreland state clearly that chukar are intimidated by quail and Moreland remarks: "Recent trapping operations during the winter. . . were not successful until the valley quail in the trapping area had been removed. . . . The chukars appeared reluctant to approach the baited area while quail were present even though there appeared to be no conflict between the two species. In only one case were chukars enticed into the traps before all the quail were removed from that vicinity."

As quail far outnumber chukar and are nearly always found closely associated with them in New Zealand the above statement would seem to be the explanation for the general failure to trap them here. A further difficulty in the way of trapping is that chukar—unlike quail—do not usually occupy permanent roosts in Central Otago, so the laying of bait trails in places where they are likely to be immediately perceived and followed becomes a matter of chance. From Moreland one gets the impression that in Washington chukar are more reliable in their roosting habits. This may be because the harder winter there seriously diminishes the amount of suitable roosting cover available at that time.

SEX RATIO.—Of 302 birds shot throughout Central Otago during the winter of 1950 it was found that 164 were cocks and 138 were hens. Thus for every 100 females there were 119 males (or 46::54). Although this sample is a small one it is probably fairly representative and is worth recording here as no other figures for the sex ratio in this species have yet appeared in the literature.

PREDATION.—Only feral cats, hedgehogs and mustelids (stoats and ferrets, etc.) can now be regarded as predators of this species under all normal circumstances. (See also, Wodzicki 1950.) Gurr, in a private communication, states that his study of the harrier **(Circus approximans)** has so far shown that the feeding habits of this hawk may be disregarded as having a modifying influence on game-bird populations. Other possible predators—such as rats and falcons **(Falco novaeseelandiae)**—are rare in most, if not all, chukar habitats.

In Central Otago large numbers of chukar are reported to be killed each year in places where strychnined carrots or swedes are used for rabbit poisoning. Strychnine incorporated in other baits (such as pollard) does not cause great mortality.

Although chukar kept in captivity in this country are recorded as having died of black-head disease, parasites are not very numerous in New Zealand wild-bred birds. The following have recently been described from some Marlborough specimens: **Goniocotes alatus** and **Lipeuris** sp. (lice)—another species, **Lagopoecus** sp. may have come from Californian quail shipped in the same container); **Rallietina graeca** (a tape worm), **Capillaria** sp. (a nematode) and **Eimeria kovoidi** (a coccidium).

In conclusion, it is worth nothing that an attempt was made during last century to introduce chukar into Australia. In 1864 twenty-three were liberated in Victoria, followed by thirteen more in 1865 and eight in 1872. The birds soon disappeared (Ryan 1906) and no attempts have been made since.

ACKNOWLEDGMENTS.—I am indebted to Miss Ruth Mason, of the Botany Division D.S.I.R. for identifications made of crop contents; to Mr. Lloyd Whitten of the Wallaceville Animal Research Station for the information on parasites; and to Mr. Richard O'Kane and various officers of the Wildlife Service for the supply of bird specimens.

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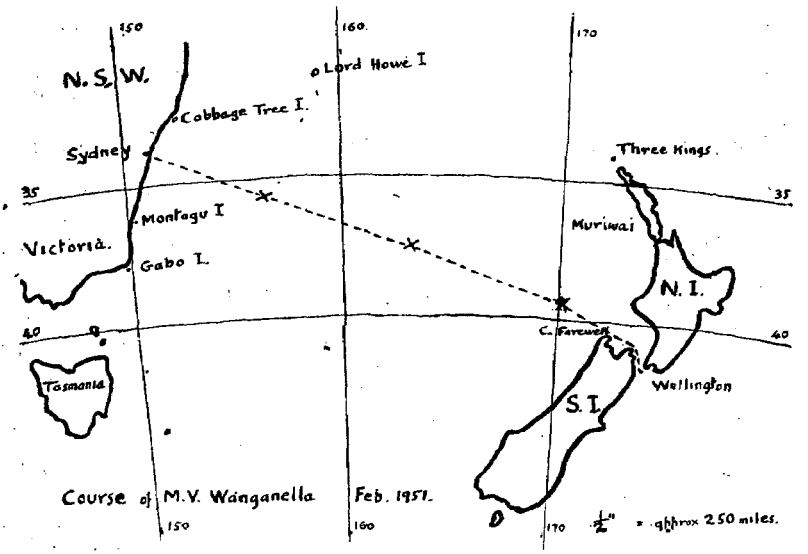
GLOSSY IBIS IN NEW ZEALAND.—A glossy ibis **(Plegadis falcinellus)** was seen near Woodville from April 26 to April 30, 1951. Mr. A. Beatty, who described the bird to me, states that it was quietly feeding in his pig paddock. His description was that the head and neck were black, the body brownish, and the wings blackish with a green gloss. With long legs (c. 14in.) of a green-black colour, the bill was long (c. 5in.), heavily down-curved and of a horn colour. This description agrees closely with that given by Serventy and Whittell in "A Handbook of the Birds of Western Australia," 1948. It is the seventh recorded occurrence of the species in New Zealand.—J. F. Robinson, Woodville.

NEST RECORDS SCHEME.—The number of cards issued in the 1950-51 season was 163, and those returned totalled 67, representing twenty species, as follow:—Blackbird 6, chaffinch 2, banded dotterel 7, grey duck 1, mallard 1, fantail 2, harrier 3, pipit 1, pukeko 1, redpoll 1, robin 4, silver-eye 3, sparrow 1, pied stilt 4, grey teal 5, song thrush 15, pied tit 3, grey warbler 3, whitehead 4. The following observers have returned cards: J. C. Davenport, D. E. Crockett, E. W. Hursthouse, Miss E. C. MacDonald, H. R. McKenzie, C. H. Parkin, R. H. D. Stidolph, L. H. Munro, J. M. Cunningham, G. F. Dobbs, W. H. Davidson, H. Taylor, Mrs. I. Tily, D. E. Prickett.—J. King, Masterton.

A TASMAN BIRD LOG.

By R. B. Sibson, Mangere.

Although beachcombing, especially after gales, on the long west coast of New Zealand has added much to our knowledge of the occurrence and movements of oceanic birds in the Tasman Sea, there are few published accounts of observations made out of sight of land. The bird log here presented was made during a spell of fair weather in mid-February, 1951. M.v. Wanganella sailed from Sydney on the morning of February 9 and berthed at Wellington early on February 13. I spent most of the daylight hours on deck and using Ross 8x30 field glasses, noted as carefully as I could such birds as came within my ken.



The identification of petrels and shearwaters from a large liner is seldom easy and the lot of the would-be oceanic bird-logger is not an altogether happy one. He has tantalizing and distant glimpses which leave him vexed and uncertain. In the Tasman Sea the task of accurate identification is made all the harder by the fact that nine species of large dark or mainly dark petrels do or may occur. These petrels, easy though they are to distinguish in the hand, are as difficult as any to recognize with certainty at sea. Size counts for little. The flight of a species will vary according to the strength of the wind. One may often have to watch for a long time before catching a flash of the silvery underwing of **P. griseus.** In some lights it is impossible to decide whether one has glimpsed the grey face of **Pt. macroptera** or the pale bill of **P. carneipes. Pr. parkinsoni** also has a pale bill and so does **Pr. aequinoctialis** which is supposed to have a white chin, but usually does not. To add to the complication **P. tenuirostris, P. pacificus, Pt. melanopus** and **Pr. westlandica** all breed on the fringes of the Tasman Sea and may be expected to forage far over it. Where I have not been certain—and this, alas, was usually the case—about the identity of the large dark petrels encountered on this crossing, I have used the term "muttonbird." Of the many muttonbirds seen I was unable to identify a single one positively as **P. griseus.** The one large dark petrel of which I could sometimes be certain was **P. carneipes.**

In New Zealand latitudes the patient scanner of oceanic birds is bound to have his reward sooner or later. A perusal of the log will show that during this crossing procellariiformes of one kind or another were spread over the whole width of the Tasman Sea between the Sydney

coast and Cook Strait, and indeed it was unusual to spend long on deck without having birds in view. I have commented in the log on some of the more interesting species which were observed: Gould's petrels five hours out from Sydney; a red-tailed tropic bird at 38deg.S.; many Cook's petrels towards dusk a few hours before the flashing of the Cape Farewell light became visible. The only gannet recorded was in Australian coastal waters.

In the short annotated list which follows the log I have collected what I hope may be helpful information for future Tasman bird-loggers who are puzzled by the large dark petrels. Known breeding places with direct access to the Tasman Sea are given and I have indicated seasonal movements in so far as they are known. Some critical readers may be surprised that the Bay of Plenty and the Hauraki Gulf which are the breeding area for large numbers of grey-faced petrels, fleshy-footed shearwaters and black petrels, are not mentioned, since it is arguable that the narrow promontory of North Auckland is no barrier to a high-flying petrel, and indeed there is reason to believe that some of the Cook's petrels of Little Barrier do fly across this promontory to feed in the Tasman Sea. Whether the large dark petrels habitually cross it is not known. During a strong northerly gale I have seen two fleshy-footed shearwaters flying before the wind over the Tamaki isthmus from the Hauraki Gulf towards Manukau. Lastly, it should be remembered that many petrels seen foraging far from land during the breeding season of their species may well be immature non-breeders, temporarily unattached either to their place of origin or to their future breeding place, which is probably the same. I am grateful to Mr. K. A. Hindwood, of Sydney, for supplying a list of relevant Australian literature, and to Mr. E. G. Turbott for friendly advice and criticism.

February 9.—Noon: Passing through Sydney Heads; 3 plus crested terns **(S. bergii)**; a few silver gulls **(L. novaehollandiae)**.

12.15 p.m.—One gannet **(S. serrator)**; one **D. exulans.**

1.30 p.m.—Distantly over the wake, seen against the light, two ? pomarine skuas **(S. pomarinus)**. This is the common skua of the S.-E. Australian coast.

1.40 p.m.—Several muttonbirds, probably **P. carneipes.** Similar birds all afternoon, some certainly **P. carneipes.** Once at least I suspected that **Pt. macroptera** was present. **(P. pacificus** also occurs in these waters, breeding on several islands to the south of Sydney, its southernmost colony being on Montagu Is.)

4.15 p.m.—One pomarine skua with tail well-developed flew over the stern.

4.55-5.35 p.m.—Four or more small gadfly petrels with gleaming white underparts and dark upper surface, the fore-edge of the wings appearing black. Without hesitation I identified these as Gould's petrels **(Pt. leucoptera)** which breed on Cabbage Tree Island, c. 80 miles north of Sydney. They ranged more or less along our course, tossing themselves up in the air in a manner quite unlike that of **P. gavia,** but strongly reminiscent of **Pt. cooki.** Several muttonbirds, one definitely **P. carneipes.**

5.55 p.m.—A pomarine skua **(S. pomarinus)** passed, not the same bird as before. Occasional muttonbirds.

February 10.—6.30 a.m.: Several muttonbirds.

7.50 a.m.—One **D. exulans.**

8 a.m.—Two **D. exulans;** one gadfly petrel, apparently **Pt. leucoptera** again.

8.20 a.m.—Many muttonbirds; one gadfly petrel as above.

8.45 a.m.—One muttonbird which looked like **Pt. macroptera.**

9.45 a.m.—Three **D. exulans.**

11.25 a.m.—One black-browed mollymawk **(T. melanophrys)**; one **D. exulans.**

11.50 a.m.—Three **D. exulans;** one **T. melanophrys.** Distant views of muttonbirds.

Noon.—35:32 S.; 156:22 E., 270 miles from Sydney. Occasional muttonbirds.

3.30 p.m.—One **P. carneipes.**

5.15 p.m.—Five **D. exulans.**

6 p.m.—c. 300 miles south of Lord Howe Island.

6.5 p.m.—One gadfly petrel with white underparts (Gould's ? again); one muttonbird.

February 11.—8-8.30 a.m.—Up to five **D. exulans.** Occasional muttonbirds one apparently **P. carneipes.**

9.45 a.m.—Two muttonbirds, apparently **Pt. macroptera.**

Noon.—37.27 S.; 163:15 E., 621 miles from Sydney; 604 miles to Wellington. No muttonbirds seen. Occasional **D. exulans.**

5.30 p.m.—Three or more **D. exulans.** A single red-tailed tropic bird **(Phaethon rubricaudus)** with the long streamers of an adult, flew up from the south, paused, but did not follow and was soon lost to view. The occurrence of this species almost on the 38th parallel and some 450 miles south of its nearest breeding station, the Lord Howe group, is of some interest. Only twice before has it been recorded so far south in the Tasman area. According to Hindwood (Emu, 47, p. 57) one was noted near Hobart, Tasmania, in February, 1917, and more recently one was blown 80 miles inland to Guildford, Victoria, in January, 1945. The nearest New Zealand record is of a fragmentary skin found at Muriwai in May, 1942. It would appear that in the early months of the year odd red-tailed tropic birds make incursions into the Tasman Sea, further south than is generally expected. It is gratifying to be able to mention that this bird was on the New Zealand side of the halfway line.

February 12.—7.55 a.m.—Five **D. exulans;** one **T. cauta.**

8.30 a.m.—Seven **D. exulans,** *including one brown-backed bird, the* youngest so far seen. One **T. cauta.**

a.m., throughout.—A few **D. exulans.**

Noon.—39:22 S., 170:2 E.; 961 miles from Sydney, 264 miles to Wellington.

1.5 p.m.—Six plus **D. exulans.** One very big muttonbird, with an easy swinging flight, possibly **Pr. parkinsoni** or **westlandica?** Far astern it showed some interest in the wake.

5 p.m.—Ten plus **D. exulans.**

5.50 p.m.—Fourteen plus **D. exulans.** The westering sun now made it difficult to watch birds over the wake. One distant mollymawk ? **T. chrysostoma.** One light breasted Arctic skua **(S. parasiticus).** The first of many Cook's petrels **(Pt. cooki)** was seen. Between now and 7 p.m. we passed through a considerable concentration of birds.

6.15 p.m.—Thirty plus **D. exulans.** One big muttonbird astern. Two **Pt. cooki.**

6.30.—Many more **Pt. cooki.** Fresh **D. exulans** kept joining us to take the place of those which dropped astern.

6.35 p.m.—One big pale-billed muttonbird, probably **P. carneipes.**

6.40 p.m.—Some dozens of **Pt. cooki** have now crossed our course in a northerly direction. One Buller's shearwater **(P. bulleri)** bigger than **Pt. cooki** but first drew attention to itself because it was not tossing itself up in the air like the Cook's petrels.

6.50-7 p.m.—**Pt. cooki** still passing northwards in numbers. **D. exulans** *still plentiful. No mollymawks* **(Thalassarche)** *were* seen to follow the ship.

February 13—6.15 a.m.—No big birds astern. Some mollymawks and wandering albatrosses glimpsed distantly. 2 ? Cape pigeons **(Daption).**

7.15 a.m.—Nearing Cape Terawhiti. One **P. bulleri**, 15 giant petrels **(Macronectes giganteus)**. Distant views of other petrels and shearwaters. Many **L. dominicanus**, a few **L. novaehollandiae** and terns **(S. striata)**.

	Wing in inches acc. Alexander.	Breeding places around Tasman Sea which are likely places of origin	Remarks.
Puffinus carneipes	12.5	Lord Howe ?; Three Kings; Cook Strait.	Summer resident. Appears in early September. Some linger in Cook Strait till May.
„ **griseus**	10.5 12.5	Three Kings; Cook St.; Stewart I.; Subantarctic Is.; rarely in S.E. Australia.	Summer resident. Great migrations sometimes noted Auckland west coast in May. Occasional winter records.
„ **pacificus**	11.5	Lord Howe; islands of N.S.W. south to Montagu (36deg. S.).	Not recorded from N.Z. proper.
„ **tenuirostris**	10.4	Tasmania and Bass St., north-east to Gabo I. (37½ deg. S.)	Summer resident. From Sept. onwards huge flocks converge along east Australian coast, migrating south. Occurs irregularly in N.Z. on migrations. Many autumn records from west coast Auckland.
Procellaria aequinoctialis	14.5	Macquarie and Subantarctic islands of N.Z.	Ranges north to about 35deg. S. Three records for Auckland west coast.
„ **parkinsoni**	13.2	Heaphy and other ranges of South Is.	Breeding season, December-May. A summer breeder.
„ **westlandica**	14.5 15 (Falla)	Barrytown, Westland	Breeding season, May-December. A winter breeder.
Pterodroma macroptera	12–13	Three Kings; Auckland coast south to Manukau. (37deg. S.)	A winter breeder. Non-migratory but ranges widely.
„ **melanopus**	12	Lord Howe (31½deg. S.).	A winter breeder, apparently absent mid-November to March. Once recorded N.Z., i.e., Muriwai.

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PIED TIT NESTING RECORDS.

By C. H. and Mrs. Parkin, Little Barrier Island.

The first of the two nesting records of the pied tit on Little Barrier Island in 1950 was unfortunately incomplete owing to desertion. It has particular value, however, in that it provides an account of the egg-laying, as follows:—

November 13.—9.25 a.m., a visitor to the island, W. P. Mead, noticed a female taking nesting material from an old stump on the creek-bank near the house. He followed her and located the nest site in the furry side of the trunk of a Japanese fan palm, nine feet from the ground. The male was present but was not seen to assist.

Nov. 14.—2.15 p.m., both birds present and nest apparently complete.

Nov. 15.—3.10 p.m., 1 egg.

Nov. 16.—4.46 p.m., 2 eggs.

Nov. 17.—12.40 p.m., 3 eggs.

Nov. 18.—11.15 a.m., 4 eggs.

Nov. 19—Gale and rain. No visit made.

Nov. 20—5.45 p.m., female sitting. Violent storm had continued until this time.

Nov. 21.—12.45 and 5.10 p.m., birds not seen. A watch was kept for several further days but they did not return. The cause of desertion was not evident. A three-legged orchard ladder was used in observing. It did not touch the tree and was not left near it. In any case the birds showed no fear of us. The storm may have temporarily worn them out, or they may have been frightened by a morepork or long-tailed cuckoo.

It is practically safe to assume that an egg was laid each day. The nest was built of moss, fibre and tea-tree bark, lined with moss and a few small feathers.

The second record, in November, 1950, was obtained from another pair located on the flat at the edge of the bush in high kanuka and mixed under-scrub. Details are:—

Nov. 14.—Mrs. Parkin found a nest 3.5 feet up in a vertical crevice in the trunk of a huge kanuka. It contained a dead chick which had reached the age of about one week.

Nov. 22.—11.50 a.m., H. R. McKenzie found a nest in a broken stump of kanuka, 10 feet up, and only 18 feet from the site of the other nest. It was almost certainly the pair which had owned the nest found on the 14th. The female was sitting on two eggs; 5.50 p.m., still two eggs.

Nov. 23.—12.10 p.m., three eggs. Female on nest. A mirror on the end of a long stick was used to examine the nest. That she was apparently incubating already is indicated by the following particulars taken by H. R. McK.: 12.10 p.m., put her off nest. She displayed on the side of a tree trunk two feet from observer's face, then moved off to six feet. The male came and fed her with a large moth at 10 feet. Female came back nearer nest and male fed to her what appeared to be two blowflies together. She then went back on the nest in full view of three observers standing 12 feet from the tree. H.R.McK. now posted himself 18 feet away in full view. 12.19: Male came to 22 feet from nest; female left nest, took food from male and returned. 12.21: Female left nest and returned quickly; did not see where she went. 12.31: Male fed her at 24 feet; she then waited about. 12.32.5: Male fed female. 12.33.5: Female returned to nest. 12.44.5: Male fed female at usual spot on small dead branches under canopy top of **Coprosma arborea**. Female then fossicked a little for herself. 12.48: Returned to nest. 12.54: Observations ceased; female still sitting. The male called when approaching with food and showed himself at 10 to 15 feet. The female would then leave the nest and fly, usually in a direct line, to the feeding place at 22 feet, waiting there for the male. She would not accept food nearer the nest. After

feeding she would return indirectly. The great amount of food consumed by the female was remarkable.

Nov. 24.—12.15 p.m.: Female sitting and coming off to be fed as before.

Nov. 28: 4.45 p.m.: Female sitting.

Nov. 30.—5.30 p.m.: Female sitting, but flew off and feigned injury.

Dec. 4.—6.55 p.m.: Female sitting. She flew off but returned quickly.

Dec. 6.—3.25 p.m.: Male feeding female.

Dec. 8.—4.5 p.m.: Female sitting; three eggs. 6 p.m.: Three chicks; all had hatched since 4.5 p.m.

Dec. 10.—10 a.m.: Female on nest; male near.

Dec. 12.—3.35 p.m.: Female feeding chicks; male near.

Dec. 14 to 24.—Ten visits; parents always present.

Dec. 25.—10.40 a.m.: Parents near. 3.10 p.m.: Parents up above nest; chicks in nest. 6 p.m.: Chicks had left nest; seen with parents nearby.

The incubation period was apparently 16 days. The period from hatching to flying was 17 days. This nest was made of punga scales and odd bits of tea-tree bark, lined with feathers, mostly of red-fronted parakeet.

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SUGGESTED DISPERSAL MOVEMENT BY SACRED KINGFISHER.—The behaviour of the sacred kingfisher **(Halycon sanctus)** in the Wellington Peninsula definitely suggests that limited dispersal movements take place. During autumn, winter and early spring the species is vagrant throughout the district. In the Makara Valley it has been seen in February, April and August. From April to August it also resorts to parks and gardens, and to the seashore. In August, small groups consort on the cliffs of the Terewhiti area. According to Dr. Oliver ("N.Z. Birds," 1930) kingfishers breed from November to January. In Wellington the birds are breeding in forest at Eastbourne and west of Wellington City by mid-November. However, kingfishers do not occupy territories in the scrublands at South Karori and South Makara for breeding until the summer solstice. Since kingfishers have been heard screeching in built-up areas in Wellington where no nesting sites exist, in late November, it is logical to assume that these birds are late breeders still on passage.—H. L. Secker, Wellington.

BIRD NOTES FROM CANTERBURY.—Several of the pupils of the Hawarden District High School have seen a white heron and in two cases two birds, as follow: May 8, 1951, at Saltwater Creek, on main North Road, about 30 miles from Christchurch (Joan Tindale); May 11, at Scargill, which is just off the main North Road, about 40 miles from Christchurch (Penny Kellock); May 15, at Sheffield (Roger Scott); May 24, at Woodend, about 12 miles from Christchurch (Dudley Hartnell); June 1, do., (Pat Currey); June 7, do., (Margaret Beaton); June 15, at Saltwater Creek, two birds (Mary Neeve); June 21, do., two birds (Ivan Stack). On June 15, at The Peaks, in the Hawarden district, a native pigeon was seen (Peter Hassall).—Margaret Beaton, Hawarden District High School.

NIGHT SINGING OF SHINING CUCKOO.—During the early months of summer a shining cuckoo sang in our garden a great deal during the day, both the long upward notes and downward notes; but at one stage it also decided to keep us awake at night with its call (usually the upward notes only). We first noticed this night singing on November 4. It ceased about November 23. On the evening of November 10, about 11.30 o'clock, I counted 54 continuous calls of the upward note and about five minutes later 32 were repeated.—Noelle Macdonald, Howick.

HABITS OF LESSER REDPOLL in the Wellington Peninsula.—Corrections, p. 64: For the word "colonies" read "territories"; for the word "irruption," paragraph 2, read "eruption."—H. L. Secker.

LITTLE BLUE PENGUIN FEEDING.—From a convenient jetty an excellent view was obtained of a little blue penguin feeding on some very small fish. From a resting place under the jetty it darted out and made a circle about 20 yards in diameter, keeping a little under the surface. Smaller and smaller circles were made, all in the one operation, until the small fish were herded into a tight circular dark pack three feet across. The penguin then drove through the pack and surfaced. Heads and tails protruded from its bill. These were quickly swallowed and it rounded up the fish pack again before it could disperse, driving through and surfacing again up to 10 or 15 times before seeking another rest under the jetty. The whole operation was repeated several times. The speed of the bird under the water was remarkable. This method of feeding is probably not uncommon. Other people at Whangaroa, not having the advantage of a jetty, had reported a "tortoise," which put its head out of the water. The "tortoise" was probably the rounded dark mass of fish and the penguin, when surfacing at the end of its charge through the fish, was taken for its head.—T. M. Roberts, Whangaroa.

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An asterisk denotes a Life Member.

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SCIENTIFIC NAMES.

The *scientific names of birds mentioned in this issue, where not given in the* text, are:—

Albatross, Wandering (**Diomedia exulans**)
Albatross, Royal (**Diomedia epomophora**)
Albatross, Light-mantled Sooty (**Phoebetria palpebrata**).
Bellbird (**Anthornis melanura**).
Blackbird (Turdus merula).
Chaffinch (**Fringilla coelebs**)
Cuckoo, Shining (**Chalcites lucidus**)
Dotterel, Banded (**Charadrius bicinctus**)
Dotterel, N.Z. (**Pluviorhynchus obscurus**)
Duck, Grey (**Anas poicilorhyncha**)
Duck, Mallard (**Anas platyrhynchos**)
Duck, Paradise (**Tadorna variegata**).
Fantail (**Rhipidura fuliginosa**)
Gannet (**Moris serrator**)
Godwit (Limosa lapponica)
Goldfinch (**Carduelis carduelis**)
Goose, Canadian (**Branta canadensis**)
Greenfinch (**Chloris chloris**)
Gull, Black-backed (**Larus dominicanus**)
Gull, Black-billed (**Larus bul'eri**)
Gull, Red-billed (**L. hollandiae**).
Harrier (**Circus approximans**)
Hedge Sparrow (**Prunella modularis**)
Heron, Reef (**Demigretta sacra**)
Heron, white (**Casmerodius albus**).
Kokako, Blue-wattled (**Calleas wilsoni**)
Magpie, White-backed (**Gymnorhina hypoleuca**).
Myna (**Acrodotheres tristis**)
Oystercatcher, S.I., Pied (**Haematopus finschi**)
Penguin, Little Blue (**Eudyptula minor**)
Penguin, White-flippered (**Eudyptula albosignata**).
Petrel, Giant (Macronectes giganteus).
Petrel, Grey-faced (**Pterodroma macroptera**)
Pheasant (**Phasianus colchicus**).
Pigeon (Native or Wood) (**Hemiphaga novaeseelandiae**).
Pipit (**Anthus novaeseelandiae**).
Prion, Fairy (**Pachyptila turtur**)
Pukeko (**Porphyrio poliocephalus**).
Quail, Californian (**Lophortyx californicus**).
Redpoll (**Carduelis cabaret**).
Robin (**Miro australis**).
Shag, Black (**Phalacrocorax carbo**).
Shag, Spotted (**Stictocarbo punctatus**).
Skua, Southern (**Catharacta lonnbergi**)
Skylark (**Alauda arvensis**)
Silver-eye (**Zosterops lateralis**).
Sparrow, House (**Passer domesticus**).
Starling (**Sturnus vulgaris**)
Stilt (**Himantopus himantopus**).
Swan, Black (**Cygnus atratus**).
Teal, Grey (**Anas gibberifrons**).
Tern, Caspian (**Hydroprogne caspia**)
Tern, White-fronted (**Sterna striata**).
Thrush, Song (**Turdus ericetorum**).
Tit, Pied (**Petroica toitoi**).
Tui (**Prosthemadera novaesee'andiae**).
Warbler, Grey (**Pseudogervgone igata**).
Weka, S.I. (**Gallirallus australis**).
Whitehead (**Mohoua albicilla**).

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