NOTES ON PARENGARENGA HARBOUR WADERS.

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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.