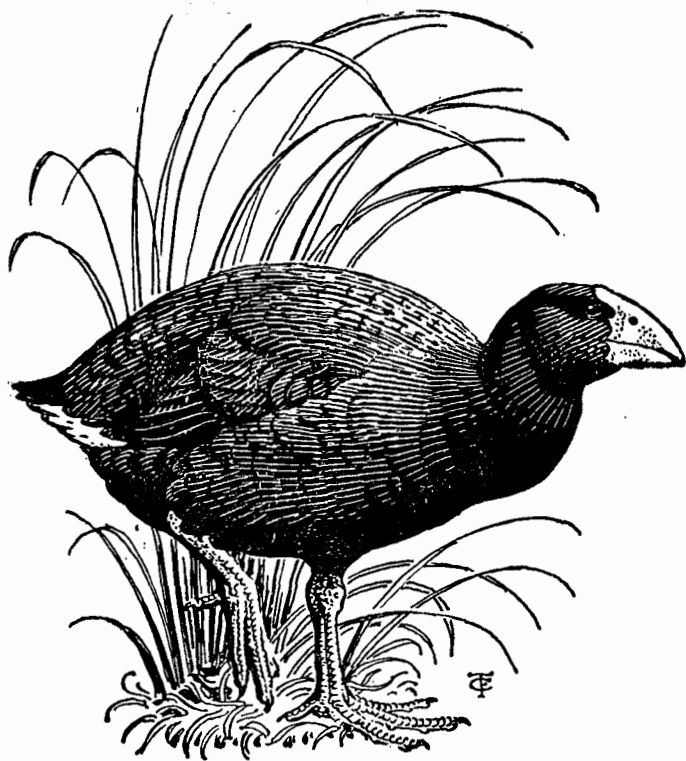


NOTORNIS



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Volume Ten, Number Three, December, 1962

NOTORNIS

In continuation of New Zealand Bird Notes

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AN ASSESSMENT OF THE SIZE OF THE CAPE ADARE ADELIE PENGUIN ROOKERY AND SKUARY — WITH NOTES ON PETRELS

By *BRIAN REID*

INTRODUCTION

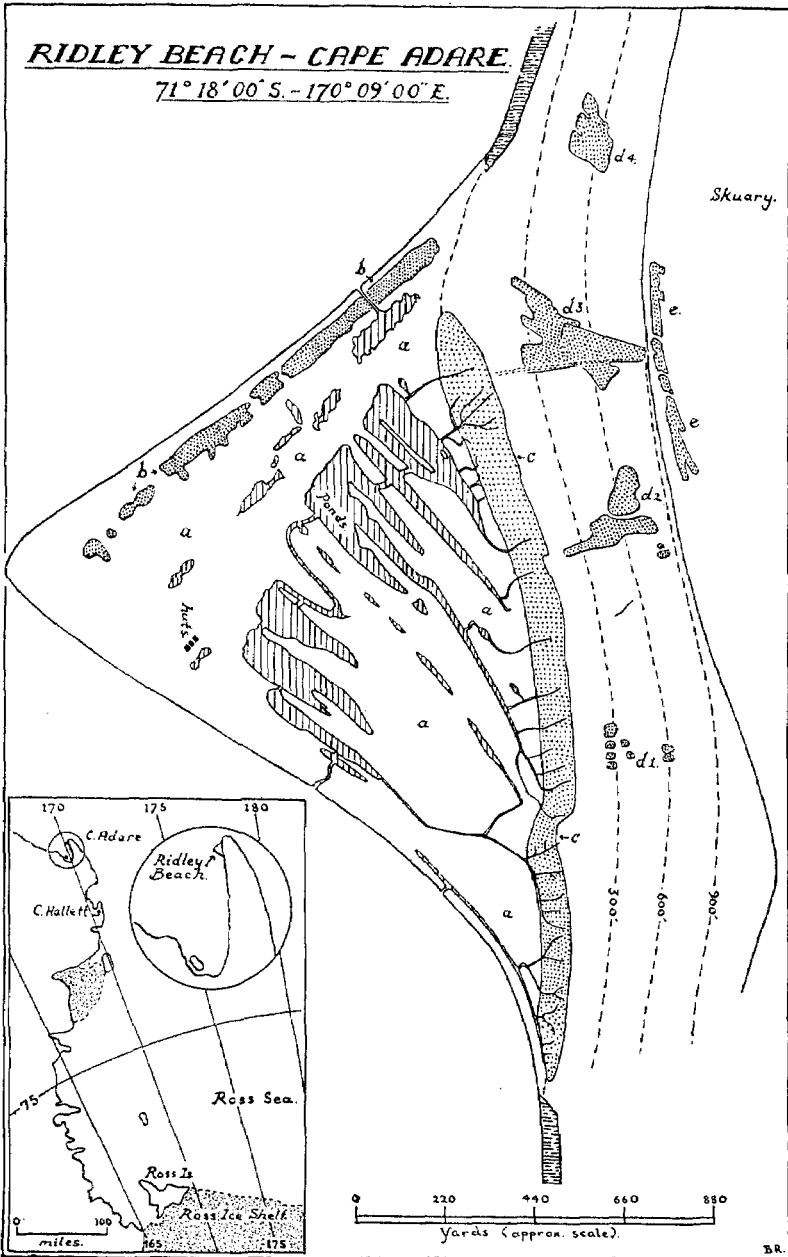
A two-man New Zealand biological party spent from January 13 to February 3, 1961, at Ridley Beach, Cape Adare. The objectives of the visit were to assess the size of the Adelie Penguin (*Pygoscelis adeliae*) and McCormick Skua (*Catharacta skua maccormicki*) populations. Bad weather and domestic problems (loss of tents and necessity for digging out the ice-filled "Southern Cross" hut) coupled with the late stage in the breeding season when the visit was made, effectively reduced the three weeks to eight days. Even during these eight days snow and semi-blizzard conditions permitted only 114 man hours in the field. Sixty-eight hours were spent in the rookery; the rest on top of the cape (900-1200ft. a.s.l.) in the skuary. Consequently the counts made and sampling methods used had to be severely trimmed. This reduction in field observations must, unfortunately, lessen the value of the census.

HISTORICAL

Cape Adare must vie with Ross Island as the most historical place in Antarctica. Its earliest visitor was the whaler "Antarctic" in 1894, and C. E. Borchgrevink, who was one of the ship's company, gave this, the first description of the Ridley Beach rookery — "the peninsular on which we landed . . . must be some 70 acres in extent; on top of the guano were lying the primitive nests of the penguins, composed of pebbles" — in a speech before the Sixth International Geographical Congress, London, 1896. Three years later (February 17, 1899) Borchgrevink again landed at C. Adare; as commander of the ten man 'Southern-Cross' Expedition who were the first to spend a winter on the Antarctic mainland. The party included a zoologist (Nikolai Hanson) who died on October 14, 1899 — the day the first penguins returned to the rookery. Consequently the biological investigations were disrupted and the earliest accounts of this rookery are general. In their books both Borchgrevink and Bernacchi include photographs and descriptions of the rookery, but other than stating there were 'thousands' of Adelies they give no inkling as to its size.

In 1911 the Northern Party of Scott's "Terra-Nova" Expedition wintered at C. Adare. Priestley and Levick both wrote narratives on their stay but whereas the former talks about 'countless thousands of Adelies' the latter, whose book is based on an extensive behaviour study of the species, states (pages 35 and 124) that the population was ". . . some 750,000 penguins." Unfortunately Levick (1914) does not include a discussion on how he determined the population size, and without data indicating the extent and type of sampling he employed, the value of his tally is somewhat lessened when used for evaluating population stability over a significant time period.

Brief discussions (Austin 1957, Harrington 1960) of the C. Adare rookery have been included in recent general accounts on the rookeries of the Ross Sea area. Austin visited Ridley Beach on February 9,



MAP 1 — Ridley Beach, Cape Adare. Outline and scale taken from 1911 ('Terra-Nova') survey. Position, size and shape of ponds plotted from oblique aerial photographs and only approximate. This map shows the position of the five independently assessed zones (a-e) into which the rookery was divided.

1956, but high seas made landing impossible. He skirted the entire beach in a small boat and from his limited observations deduced that . . . 'The Ridley Beach colony is the second largest (to C. Crozier) in the region. It supports at least 75,000, and perhaps more than 100,000 breeding pairs of Adelies.' Harrington states — 'It is a very large rookery, comparable in size with the main rookery at C. Crozier.' The latter, he considers, 'might contain half-a-million or more adult birds.'

DESCRIPTION

C. Adare (71° 18' 00" S., 170° 09' 00" E.) marks the north-west corner of the U-shaped Ross Sea. Ridley Beach extends 1300 yards westward from the Cape into Robertson Bay. This is a low pebble-beach (max. ht. a.s.l. approx. 18-20 feet) triangular in shape and roughly 230 acres in area. The surface is, for the most part, undulating and the penguins breed in colonies on top of the hummocks and mounds. Several of the depressions are large and permanently filled with ice which thaws during the summer to form lagoons and ponds. These cover an estimated 35 acres, or nearly one-sixth of the beach area. Along the base of the triangle where the beach abuts onto the cape there is a talus shelf (50 feet a.s.l.) and this raised strip adds 50 odd acres to the overall beach area (i.e. total of 280 acres). Behind this the slope rises steeply for 850-1100 feet. It then flattens out to a gentle incline which forms the top of the C. Adare promontory. This drops sharply to the Ross Sea on its eastern side. The areas were obtained by plani-metering the limits on a 1:15,000 surveyed map made by Lt. Campbell of the 1911 'Terra-Nova Expedition. Lt. Colbeck's (1899) 1:25,000 map gives a total area of 240 acres but rough field measurements made in 1961 suggest the larger (280 acre) area is more correct.

SIGNIFICANCE OF THE SURVEY

The Antarctic has become the scene of considerable activity which started in the summer of 1955-56 in preparation for the I.G.Y. (1957-58) and continues with many of the Stations becoming permanent fixtures. Prior to 1955 there were ten known Adelie rookeries in the Ross Dependency area. The current operations have unearthed rookeries at C. Hallett and Beaufort Island as well as ' . . . a large number of Adelie Rookeries' (Harrington, 1960) in the Balleny Islands. Harrington also mentions the possibility of two other rookeries — one on the Koettlitz Glacier moraine and the other being a second rookery in the Wood Bay area.

Several of these rookeries have recently been assessed but as Caughley (1960), whose estimations are at a variance with Austin's, states, — "the dates of visits at rookeries are more likely to be dictated by the availability of time and transport than by the optimum time for estimating a rookery's size."

Both of these workers were handicapped by having only a few hours at the rookeries they inspected. Sometimes they had to be content with making their assessments from off-shore in a boat.

What is required is some reasonably thorough census work in all the rookeries which will, along with giving their size and structure, also indicate the total Adelie population in the Ross Sea. This is the fundamental precursor to a conservational approach in Antarctic

biology. It will, in all probability, not be practicable to conduct complete surveys in all the rookeries but if reliable data are available from a few, the populations of the others can be reasonably accurately inferred from aerial photographs. (Scale = $\frac{f}{H-h}$ and once the scale is known the area of the colonies can be determined while data from counted rookeries will give the breeding density or correction and conversion factors).

So far the populations in two rookeries, C. Roysds (Taylor, 1962) and C. Hallett (Reid, unpub.) have been accurately counted. These are the two rookeries which require the most attention because, while the others remain unmolested, they are subjected to persistent human activity and interference. It is not yet known what final effect human operations will have on these rookeries. Cape Hallett is very similar to C. Adare. Both rookeries are extensive and situated on pebble spits extending out from the western face of northward pointing headlands. From every aspect it is doubted whether such similarities (climatic and geographical) exist in any other two distinct rookeries. The one significant variable is (as stated above) that C. Hallett is permanently inhabited by humans.

With the demographic studies so far conducted by New Zealand workers *information from an unmolested rookery* was needed to form a yard-stick by which trends occurring in disturbed rookeries can be gauged.

Basically, it was hoped that the C. Adare Adelie survey would be of value in three ways:—

(1) By indicating the stability of the species over a considerable time period; i.e. whether the population is maintaining itself or has increased or decreased during the 50-year period which separates the two surveys. The 1960-61 census gave a total adult population of roughly 700,000 ($\pm 3\%$) birds which is only 6-7% less than Levick's figure of 750,000 birds. This difference (even allowing for the known imperfections in the 1960-61 census methods and the unknown quality of the earlier assessment) is barely significant and, in the writer's opinion, does not in any way indicate that populations existing under normal conditions are declining.

(2) In providing a yard-stick by which future trends at the C. Hallett rookery can be gauged. If the Hallett rookery should show a decline in population, check counts can be made from time to time at C. Adare where, if the same trend is evident the C. Hallett population decrease need not necessarily be attributed to human activities and other causes can be sought for. (To date there is no evidence of a decline at Hallett although over 10% of the rookery area has been confiscated for human use and human activity causes many disturbances of varying magnitude throughout the breeding season.)

(3) As additional ground data to supplement aerial photography for the more accurate assessment of the remaining rookeries in the Ross Sea, especially those of Franklin and Beaufort Islands which are (from all accounts) strictly comparable with C. Hallett and C. Adare.

ADELIE ROOKERY: ASSESSMENT METHODS

The population of an Adelie rookery oscillates and its composition varies throughout the breeding season. On January 13 the chicks were at the "Creche" stage* (Sladden 1958) and the ratio adults: chicks was roughly 1:10. During the next three weeks the ratio (through the movement of adults to and from the sea) continually changed; from an estimated 1:24 (Jan. 21); to 3:8 (Jan. 27); to 1:20 (Feb. 1). In this same period, as more of the chicks fledged, the creches began to disintegrate because of the older (moulted) chicks breaking away and accumulating along the foreshore prior to their departure for the winter grounds. Fledglings first started gathering along the foreshore on January 21 and by January 26 it was estimated that nearly 15% of the juvenile population was on the foreshore.

Data from a comparable rookery (C. Hallett, Reid, unpub.) shows that during the period that the C. Adare survey was made the adults present fluctuate to such an extent that the number present on any one day may represent less than 5% or as much as 25% of the breeding population, or be any number between these values. Therefore, during this stage adult counts are of no value in determining the total population and the chicks present (although representing an unknown percentage survival of the total eggs laid) along with the number of colonies in, and the total area of the rookery, provided the only yardsticks for the census.

The rookery is divisible into two main regions (pebble beach and hillside) and within these the birds occupy five (a-e, Map I) merging but, none the less, quite distinct zones. These are:—

- (a) The main area of Ridley Beach: This zone includes all of Ridley Beach except along the foot of the hill and the north beach section. The ground is undulating and the penguins breed in distinct colonies, of from 300-5,000 or more square feet, situated on mounds and ridges.
- (b) The north beach section: The northern zone of the beach is higher and fairly level. The birds occupying this section breed in a long dense ribbon extending almost the length of the north shore.
- (c) The shelf section: Along the eastern margin of Ridley Beach talus has formed a sloping ledge about 30 feet above the beach and several hundred yards long. The slopes and top of this ledge are densely populated by a ribbon colony approximately one mile in length. (The colony extends beyond the ends of the shelf.)
- (d) Along the western slope of the C. Adare promontory above the beach there are four colonized regions (d1-d4) one of which (d3) extends to the lip of the hill approximately 900 feet a.s.l.
- (e) Above the lip of C. Adare on the gently sloping top there is a small colonized region which is virtually a continuation of d3.

* **Creche Stage:** For the first month after hatching the parents alternate duty, one always being with the chicks while the other collects food. When the chicks are about four weeks old they are quite big (4lb.) and strong. At this age their vigour permits and their appetites demand that both parents be employed collecting food. Consequently the adult population drops, being composed of a transitory mixture of non-breeders and unsuccessful breeders as well as parents making brief visits to feed their young. During this stage of the breeding season the chicks within a colony leave their nests (which no longer provide a sanctuary) and gather in close "protective" clusters or creches.

Different methods were used to arrive at the chick populations, depending on the size and character of the zones — and on the time available. Data from comparable zones at C. Hallett supplied the recruitment mortality figures which made possible the conversion of 'number of surviving chicks' into 'breeding pairs.' The reliability of this population census depends equally on the accuracy with which field measurements and counts were made, and on the assumption that, in fact, mortality at C. Adare was comparable with C. Hallett.

Zone (a) — Three methods (total area, total number of colonies, and C. Hallett population density) were used to determine the breeding population of this area. The sample area measured 175 x 200 yards (35,000 sq. yds.) and contained 25 colonies with a chick population of 9,200.

1. Total Area: This was calculated (from 1911 map and rough field measurements using a 100 foot rope) at 150 acres (726,000 sq yds.) giving 190,800 chicks. Recruitment survival was rated at 68%.

$$\therefore \text{Breeding Population} = \frac{9200 \times 726000 \times 100}{35,000 \times 68 \times 2} = 140,300 \text{ pairs}$$

2. Total Number of Colonies: This area contained 430 colonies suggesting a breeding population of approximately 116,000 pairs (e.g. $\frac{9200 \times 430 \times 100}{25 \times 68 \times 2}$). However the colonies are not of equal area. Eight of the 25 colonies in the sample area were characteristic of the smallest type of colony, the other 17 of the next size group (i.e. twice the size). If each of the smallest colonies is given a unit breeding area of 'one' the breeding area of the 25 sample colonies equals 42 (8 x 1, 17 x 2). From a series of aerial oblique photographs (taken at various angles from an altitudinal range of 300-1500 feet) it is possible to roughly place the other 405 colonies in their size groups. A total breeding area of '821' (158 x 1, 196 x 2, 43 x 3, 26 x 4, 4 x 5, 3 x 6) was obtained giving 179,800 chicks.

$$\therefore \text{Breeding Population} = \frac{9200 \times 821 \times 100}{42 \times 68 \times 2} = 132,200 \text{ pairs.}$$

3. C. Hallett Population Density: The pre IGY area of the Seabee Spit section of the Hallett rookery was approximately 57 acres and the population 47,000 pairs (55,700 minus 8,700 for the north beach ribbon colony). The Ridley Beach section of the C. Adare rookery is very similar and has (by including the zone occupied by the north beach ribbon colony) an estimated overall area of 165 acres.

$$\therefore \text{Breeding Population} = \frac{47,000 \times 165}{57} = 136,000 \text{ pairs.}$$

By these three methods the breeding population of Zone (a) is between 132-140 thousand pairs.

Zone (b) — Both members of the party measured and assessed this long, virtually continuous, north beach colony independently by pacing its length and width at fixed intervals; and by making a chick count in an accurately measured typical area. Recruitment survival was rated at 64%.

1. Length of colony 950 yards, average width (based on cross pacing every 20 yds.) 27 yards. Total area approx. 25,500 square yards. The sample area was 1430 square yards and contained 2385 chicks; giving a total chick count of 42,500.

$$\therefore \text{Breeding Population} = \frac{42500 \times 100}{64 \times 2} = 33,200 \text{ pairs.}$$

2. Length of colony 1100 yards, average width (based on fewer cross measurements) 25 yds. Total area approx. 27,500 square yards. The sample area was 925 square yards and contained 1700 chicks. This gives a total chick count of 50,500 and a breeding population of 39,500 pairs.

These two assessments place the Zone (b) breeding population between 33,200 and 39,500 pairs.

Zone (c) — This area was roughly measured at 50-52 acres, being approximately 1800 yards long and having an average width of 135-140 yards. An area of 45,000 square yards at the southern end was used as the sample. This contained 22,000 chicks. Recruitment survival was rated at 66%. Two methods (chick density in the sample area, and C. Hallett pair density) were used to determine the breeding population.

1. Chick Density: In the sample area there were 2366 chicks per acre, giving a total chick population of from 118,000 (50 acres) to 123,000 (52 acres).

$$\therefore \text{Breeding Population} = 89,400 - 93,200 \text{ pairs.}$$

2. Cape Hallett Stocking: The comparable hill slope sector at the Hallett rookery is 3.5 acres and contained 6,400 breeding pairs. Therefore the area at Cape Adare (if between 50-52 acres) would have a breeding population of 91,400-95,100 pairs.

These two methods place the Zone (c) breeding population between 89,000 and 95,000 pairs.

Zone (d) — Is composed of four distinct areas ('d1-d4') separated by bare rock outcrops and scree slope. In two ('d1, d2') all the chicks were counted but the chick populations of the other two were estimated from their areas relative to the area of 'd2.' From counts; 'd1' contained 2050 chicks and 'd2' 7,500 chicks; while 'd3' had an estimated 10,000 and 'd4' an estimated 4,000 chicks. Recruitment survival was rated at 60% giving the following breeding populations:— 'd1' 1,700, 'd2' 6,250, 'd3' 8,350 and 'd4' 3,300 pairs — i.e. a total of 19,600 pairs in Zone 'd.'

Zone 'e' — Is situated just above and parallel with the lip of the hill, between 900-1100 feet above sea level. This zone extends for 600 yards and consists of fourteen reasonably distinct guano covered areas each of which contains between 1-10 small colonies. The entire chick population was counted on January 19. There were 6474 chicks. Recruitment survival was rated at 56%, giving a breeding population of $(\frac{6474 \times 100}{56 \times 2})$ approx. 5,800 pairs.

TOTAL (CALCULATED) ADULT POPULATION

The following table gives breeding population for each of the five zones along with the estimated percentage error. The percentage error was determined on the assumption that the actual population could be any figure ranging from and including either the minimum or the maximum obtained by the sampling methods, and need not necessarily be the mean of these values or occupy any position between them.

Area (Map 1)	Chicks (x 1000)	% Survival	Tot. Eggs (x 100)	Breeding Pairs
a	180-191	68	2647-2809	136,400 \pm 3.0%
b	43- 50	64	672- 781	36,300 \pm 7.5%
c	118-123	66	1788-1864	91,300 \pm 2.0%
d	23- 24	60	383- 400	19,600 \pm 2.0%
	6.5	56	116	5,800
				289,400 \pm 3.0%

Non-breeders represent approximately 20% of the breeding population. Therefore, the estimated total adult population is (\pm 3%) 695,000 birds, and comprises roughly 579,000 breeders and 116,000 non-breeders.

THE SKUARY

This is situated on the gently sloping (and rolling) tableland on top of the cape. Its aspect is W-NW and it overlooks Ridley Beach 1000 feet below. The area was roughly surveyed (the only equipment for obtaining distances, angles and slopes being a 100-foot long climbing rope) and no claims for any great accuracy of the accompanying map are made. However, measurements give the overall area of the skuary as between 155-160 acres while nest counts show the greatest breeding density to be in its northern part with particularly heavy stocking along the western lip of the cape continuing north of the (Zone 'e') Adelie colonies.

In this (A.O.) strip the average distance between skua nests was only 21 yards and the average territory size approximately 450 square yards. The smallest territory was 200 square yards and the largest over 2,500 square yards. In area F, on the other hand, average nest spacing was 82 yards and the territory areas ranged between 3,000-10,000 square yards. Further south, in areas G and H, where the nests were in general even more scattered the intervening distances were estimated as pacing between them was not practicable.

Some nest counts (areas H and I) were made on January 15 but the main work was done on January 25. During this day the skuary was covered with snow which continued to fall most of the time. With the white-out conditions, difficulty was experienced in making a grid survey. Some nests were probably missed while others were, in all likelihood, counted twice.

The following table summarizes the skuary survey.

Area (Map 2)	Yards between Nests		Eggs and Chicks Nests with							Adults Present Nests with		Total Nests
	Min.	Max.	O	1E	2E	1E1C	2C	1C	1 Bird	2 Birds		
AO	5	55	3	-	-	1	-	37	12	29	41	
A	10	95	1	-	-	-	-	23	10	18	28	
B	10	65	8	1	-	-	2	30	11	30	41	
C	10	70	5	-	-	-	-	28	11	22	33	
D	10	170	3	-	-	-	4	18	9	16	25	
E	40	220	1	-	-	1	1	9	3	9	12	
F	40	150	3	1	-	-	2	16	8	14	22	
G	40	200	2	1	-	-	-	9	3	9	12	
H	10	160	5	-	2	1	-	16	10	15	25	
I	35	220	4	2	1	1	-	8	4	12	16	
			35	7	3	4	12	194	81	174	225	

The closest distance between neighbouring nests varied from 5 yards to over 200 yards. In 42 cases (17.5%) the distance between nearest neighbours was 5-15 yards; in 73 cases (30.0%) 16-30 yards; in 47 cases (19.5%) 31-45 yards; in 25 cases (10.5%) 46-60 yards; in 15 cases (6.0%) 61-75 yards; in 12 cases (5.0%) 76-90 yards; in 15 cases (6.0%) 91-120 yards; in 8 cases (3.5%) 121-180 yards and in 5 cases (2.0%) nearest neighbours were more than 180 yards apart.

The counts made on January 25 indicate the skua breeding population as 220 (255-35) pairs. On the same date (Maher pers. comm.) counts were made in a defined area of the C. Hallett skuary in which a total of 119 breeding pairs had territory. By January 25 only 84 (70%) of these nests contained young. If the same nest survival is assumed for C. Adare the Adare breeding population would be 314 pairs. A similar total breeding population is obtained by comparing the total number of nests still evident on January 25. At C. Hallett there were 102 (of the original 119), comprising the 84 with young and 18 in which the pairs had lost their brood but still maintained territory. At C. Adare there were 255 (220 with young and 35 where the brood was lost but the pair were still present). On the basis of the number of nests still evident the Adare (hill top) breeding population would contain 298 pairs.

There is a second, very much smaller, skuary situated on the talus shelf just above the Zone 'c' section of the Adelie rookery. This has previously been recorded by both the 1899 and 1911 expeditions. Although no productive nests were found there in 1961 evidence indicated a breeding population of 10-15 pairs. A brief search was made on January 13 and 42 adults were counted in the area.

The writer considers that chick mortality and nest abandonment would be higher at C. Hallett than at C. Adare because of a certain amount of interference from the research station staff. Therefore, on a percentage survival basis the size of the Adare hill top skuary has probably been over-estimated. This can be roughly corrected by ignoring the (estimated) 10-15 nests on the talus shelf and subtracting this number from the mean of the hill-top totals.

By this method there are 306 breeding pairs of skuas (294 on top of the Cape, 12 on the shelf) at C. Adare. The clutch generally consists of two eggs and of the (calculated) 575 eggs laid on top of the Cape there were 239 (222 chicks, 17 eggs) present on January 25. This gives a low (40%) survival figure, but none the less it is well above the figure (25%) obtained on the same date from an egg and chick survival study of 155 nests conducted at C. Hallett during the preceding summer (Reid, unpublished).

Various counts made during the three weeks place the total adult population between 730-760 birds (612 breeders, 120-150 non-breeders). From the point of making a census the adults could be divided into six groups although the status (ratio of breeders to non-breeders) of the birds in five groups could not be known. Five of these groups were counted; the sixth (number of birds away feeding) was estimated. These were (1) birds at nest sites, (2) solitary birds in the skuary, (3) clusters in communal areas in the skuary, (4) birds gathered on the north beach, (5) birds gathered on the south beach and (6)

birds flying over the sea and rookery, or in the rookery feeding. The total population was determined from the following observations of these groups:—

Birds at nest sites — On January 15, 41 nests were found. At 27 nests both adults were present while at the other 14 (34%) only one bird was in attendance. On January 25 the rest of the skuary was covered and 214 additional nests located. Of these, 67 (32%) had only one adult present. These tallies suggest that the number of adults presiding over their territories barely varied from day to day as the number absent was confined to between 16-17%; implying that there were usually approximately (84% of 520) 430 adults on nest duty in the skuary.

Solitary birds in the skuary — Along with the previous group there were roughly 30-40 solitary birds. These exhibited no territorial behaviour and were scattered throughout the area. They were quite possibly members of unsuccessful or inexperienced partnerships.

Clusters in the skuary — On three occasions two small clusters were seen on the lip overlooking the beach. These contained 35, 29 and 32 birds (January 15, 25, 30) suggesting that around 30 birds usually congregated at these two points.

North Beach — On seven days that the north beach was covered two or more small groups of skuas were seen. The daily totals were between 19-53 and the average number in this area was 30.

South beach — This was the main gathering area for the birds who collected in three or more quite large groups. Eleven counts were made between January 13 and February 2. The tallies varied between 123-222 and averaged 180 birds.

Birds away feeding — A certain percentage of the birds were always either feeding in or flying low over the rookery; or else were out at sea. During walks through the penguin colonies a number of these would be disturbed and based on the frequency with which these birds were met along with sightings of them at sea it seems probable that they equal approximately 20% of the north and south beach total, i.e. 40 birds.

PETRELS

Four species (Giant, Antarctic, Snow and Wilson) were seen at C. Adare.

Giant Petrel (*Macronectes giganteus*) — Murphy (1936) records this species as probably breeding at C. Adare but during 1961 no evidence was found to support this. Accounts of both the 1899 and 1911 expeditions contain nothing to indicate a breeding colony. In fact Borchgrevink (1901) writes — “. . . Gigantic Petrels also visited Camp Ridley. They were very scarce during the summer, but we saw several of them during the autumn. We did not find one of their nests, and their visits were always short and interrupted; and to a great extent I ascribe their visits to Robertson Bay and our peninsula to strong gales at sea, which drove them in towards shore for shelter. In fact, during the strongest gale we had in the autumn, they arrived at Camp Ridley the day before the gale commenced, and left immediately after it was over. So I came to look upon their arrival as the sign of an approaching gale.”

The significance that Borchgrevink attributes to their visits certainly indicates the nature of the weather experienced in January 1961, for varying numbers of Giant Petrels were present every day during the writer's stay. Both the grey-brown and 'pure' white varieties were seen. Counts made of the number present indicate that at this latitude 6% (42 out of 672 sightings) of the birds are of the white variety. These birds always congregated along the northshore at the point of Ridley Beach. Because of inclement weather it was not possible to make counts every day but the following (which give a maximum number of 115 at any one time) were recorded.

Date	Time	Brown	White	Total	Date	Time	Brown	White	Total
Jan. 13	7am	16	1	17	Jan. 24	10pm	93	8	101
"	13 6pm	40	3	43	"	25 10am	25	2	27
"	14 9pm	59	4	63	"	28 4pm	108	7	115
"	15 7pm	39	-	39	"	29 8pm	29	-	29
"	16 9pm	86	6	92	"	30 7pm	58	4	62
"	20 6pm	21	-	21	"	31 10pm	15	2	17
"	21 6pm	31	3	34	Feb. 2	9pm	12	-	12

Antarctic Petrel (*Thalassoica antarctica*) — Flocks of from 10 to 100 birds with an odd solitary bird were seen heading northwards up Robertson Bay during the evening of January 29. Throughout the day the wind blew steadily at 35-45 knots with occasional gusts exceeding 55 knots. This was the only time these birds were seen so they probably do not nest on the cape, but near the head of the bay. They were first spotted at 7.40 p.m. and it is not known how long they had been passing overhead. There was a steady passage of them until 8.55 p.m. During these 75 minutes a one-minute count was made on every third minute and for the 25 minutes 1330-1360 birds were seen. They averaged 53-54 a minute giving a total of 3755-4050 for the 75 minutes. The maximum number to pass overhead during a counted minute was 210-230, and the next highest one minute count was 175-185. At the other extreme, during the ninth minute none were seen while on the third minute only two passed overhead.

Snow Petrel (*Pagodroma nivea*) — On two or three occasions the odd bird was sighted skirting low over the water during gusty weather. No nest sites were found on the western slopes of the cape above Ridley Beach but accounts of the early expeditions record them as breeding on the precipitous eastern (Ross Sea) slopes of the cape and also in various areas at the head of and across Robertson Bay.

Wilson Petrel (*Oceanites oceanicus*) — Three were seen on the western slopes of the cape. All darted into fissures in perpendicular rock outcrops quite inaccessible to humans. It appears that a small scattered population breeds on this slope.

ACKNOWLEDGEMENTS

The writer particularly wishes to thank Dr. Colin Bailey of Adelaide for accompanying him on this trip and for doing the mammoth share of the tedious Adelie chick counts; and also Mr. W. Maher for

supplying comparative skua data from C. Hallett. Thanks are also extended to Dr. R. A. Falla (Dominion Museum) and Mr. G. W. Markham (Antarctic Division, D.S.I.R.) not only for permitting this deviation from the established programme but also for giving it the necessary authority. Grateful thanks are extended to the U.S. Navy who supplied transport and equipment and without whose considerate co-operation the survey would not have been possible.

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SPEED OF ADELIE PENGUINS ON ICE AND SNOW

By R. H. TAYLOR

Animal Ecology Division, D.S.I.R., Lower Hutt

The Adelie Penguin (*Pygoscelis adeliae* Hombron and Jacquinot) is well known as a bird superbly adapted for movement in water, a proficiency gained at the expense of its power of flight. The purposes of this note are to draw attention to the Adelie's remarkable performance "overland" and to record some observations on its speed over ice and snow.

When ashore Adelies have two main methods of progression, walking and tobogganing. When tobogganing they slide on their breasts, pushing themselves forward with their feet. On a journey they alternate between the two methods (see Plate XI), both to "relieve the monotony" and to suit the nature of the snow surface, usually walking on firm or rough going and tobogganing on softer snow (Levick, 1915). Their normal rate of travel is the same, walking or tobogganing, and in a group moving together over the ice both methods are often simultaneously in use by different birds.

That Adelies can travel vast distances ashore is well illustrated by records of penguins found wandering far inland in Antarctica. Both Wilson (1907) and Shackleton (1909) noted Adelie Penguins, or their tracks, 60 miles from the sea on the Ross Ice Shelf, and Sladen and Ostenson (1960) recorded penguin tracks (probably those of an Adelie) found in January 1958 on the Ellsworth Highland, 186 miles from the nearest known coast.

When Adelies first arrive at the breeding rookeries during October, they must often have travelled over fast ice for more than 30 miles, and sometimes up to 60 miles, from the nearest open water

(Sladen, 1958). Even when feeding chicks later in the season adults may have to travel considerable distances ashore. For instance, at the Cape Royds rookery in 1959, open water was still about four miles north when the first chicks hatched on 10th December. Even so, most parents changed guard duties every day (Taylor, 1962), having travelled over the ice, collected food for the chicks, and returned to the rookery within 24 hours.

The Antarctic literature contains several apparently conflicting reports on the speed at which Adelies normally travel over sea ice. Murphy (1936) stated, "the normal rate is the same by both means, namely anything up to 8 kilometers [5 miles] an hour." On the other hand, Levick (1915) wrote, "their little legs enabling them to advance only about six inches at each step; but going at the rate of about 130 steps per minute, they covered some two-thirds of a statute mile per hour," and Bernacchi (1901) estimated their speed over ice as about one mile an hour. Murray (1909) gave their top walking speed on level ice as "about as fast as a man at a smart walk," and Sapin-Jaloustre (1960) who followed a group of penguins over sea ice for several hours, estimated their speed at about four to five kilometers (2.5-3.0 miles) per hour.

To check the rate at which birds were crossing the ice at Cape Royds, on 11th and 12th December 1959, groups of penguins travelling together were timed over marked distances, varying between 250 and 350 yards, on several approach routes about a quarter of a mile out from the rookery (Table 1). Nearly all the penguins were walking on these measured routes over the sea ice, which was sparsely covered with snow and free of major obstacles. Occasional, usually momentary, pauses were not deducted from the recorded times. On both days there was a 15 knot southeast wind which favoured penguins leaving the rookery for the sea. This could account for the apparently faster rate of outgoing birds, but it could equally be argued that these had only just started their journey, whereas those coming in had already travelled four miles.

TABLE 1

Rate of Travel of Adelie Penguins over sea ice at Cape Royds

No. of Penguins in group	Direction of travel	Miles per hour
18	to rookery	1.86
11	to sea	2.43
11	to sea	2.39
2	to sea	2.11
1	to sea	1.75
1	to rookery	1.62

* Recorded while author seconded to Antarctic Division, D.S.I.R.

These few records suggest that the Adelie's normal rate of travel over level sea ice is between 1.5 and 2.5 miles per hour; though of course when frightened, or hurrying for some other reason, they can toboggan at much greater speeds for short distances (Brown, 1913), and this might explain the apparent discrepancy in some of the early accounts.

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THE EXTINCTION OF MOAS AND OTHER ANIMALS DURING THE HOLOCENE PERIOD

By C. A. FLEMING, N.Z. Geological Survey

The Holocene Period comprises in round figures the last ten thousand years, and is equated with the post-glacial. During the Pleistocene (i.e. the previous one or two million years) world climate underwent severe fluctuations. In New Zealand a large number of plants and animals with more or less long histories in the Tertiary became extinct during the Pleistocene, and the Holocene began with an impoverished biota which lacked organisms sensitive to the types of environmental changes that had characterised the ice ages. Any such stenothermal organisms had disappeared long before during the earlier Pleistocene climatic catastrophes. Among marine organisms, for instance, most of the Pleistocene extinctions took place in the first two glaciations.

The early post-glacial time of warming climate and rising sea-level, from ten thousand to six thousand years ago, is not characterised by extinction, but on the contrary by faunal diversification and active colonisation. Thus, a recent analysis of the likely age of mainly Australian derivatives among New Zealand birds (Fleming 1962), suggests a considerable number of immigrations and some speciation during the early Holocene. The Holocene culmination of post-glacial warming, often termed the Climatic Optimum or Thermal Maximum, apparently during the interval from 6000 to 4000 years ago, was followed by minor cooling that could have led to extinctions, but I can only think of one that falls in that period. The "Sydney cockle," *Anadara*, came to New Zealand during at least one of the early inter-glacials, and returned to Northland for a brief interval in post-glacial time, judged by its occurrence as fresh shells near present sea level at Hokianga, in shallow wells at Marsden Point and elsewhere. Its absence as a living animal suggests the only known post-glacial extinction among marine invertebrates.

The Late Holocene, i.e. the last 4000 years, has been characterised by building out of coasts, advance of dunes, ponding of streams to produce coastal peat swamps, and moderate alluviation of many inland valley bottoms after the interval of early Holocene down-cutting that followed the Last Glaciation. The deposits formed in this late Holocene phase are the main sources of bones of the moa, of extinct birds of

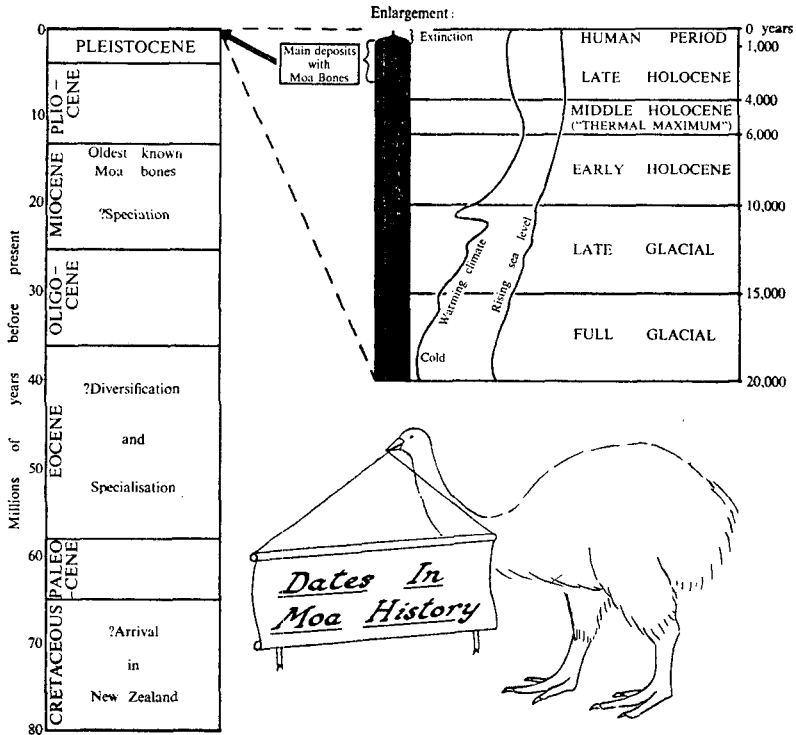


FIG. 1 — Although the Dinornithiformes probably had a long history in New Zealand (time-scale left) the oldest fossil bones are Upper Miocene and the main sources are late Holocene. The enlargement (right) shows their extinction in the human period, thousands of years after the climatic changes to which it has sometimes been attributed.

other groups, and shells of locally-extinct land mollusca. Though it would be rash to be dogmatic, it is doubtful if any major source of extinct bird bones so far known in New Zealand is as old as early or even mid Holocene in age, let alone Pleistocene. The older moa deposits (and there are many) have generally yielded only a few bones, poor in preservation. Fig. 1 shows some dates in Moa history plotted on a scale of absolute time. The dates of their arrival, diversification, specialisation, and speciation are not supported by fossil evidence and are thus speculative.

For some years, the conventional view on the extinction of the moa, held by Duff and Falla after their classic studies of Pyramid Valley swamp and Wairau Bar (1941; 1942), was "that the moas were dying out naturally — from climatic change leading to restriction of grasslands . . . or from the delayed effects of increasing insularity on a continental avifauna, and that man found only smaller genera, notably *Euryapteryx*, surviving sporadically on the east coast of the South Island" (Duff, 1956, p. 280).

Evidence on the late persistence and human association of moas is scattered and has not previously been brought together as part of the problem of the date and cause of extinction of the whole moa fauna. Fig. 2 shows data compiled mainly from published sources for the complete list of 27 species of moas recognised by Oliver (1949). The doubtful fossil species (*Anomalopteryx antiquus*) is omitted. Five species are known from undoubtedly late Holocene deposits but not in human association. Twenty-two species, representing all genera, are known in well-documented human culture sites. Three species, representing two genera, have been directly dated by 14C analyses of their bones or stomach contents (Lockerbie; Deevey) as between 1280 A.D. and 1670 A.D. (shown by black circles). Three additional species (two additional genera) have been dated by the close association of their bones with charcoal or tussock bedding that has itself been dated by 14C (shown by crosses). Ten additional species occur in sites that have been dated (Papatowai, Wairau Bar, Pyramid Valley), but are not so closely tied to the dated material as to establish their ages (shown by queries on Fig. 2).

The five species not yet demonstrated to have lived in the human period include four species that are described as unique, rare or sparingly distributed (in dune, swamp or cave deposits), and another (*Euryapteryx tane*) confined to the North Island. A review of their localities and the deposits where they were found gives no reason to suspect that they are any older than the species known in human association, and they probably survived into the human period.

		7 genera 27 species	7 genera 22 species	7 genera 16 species				
		MAINLY LATE HOLOCENE (undated)	HUMAN ASSOCIATION ?1000 AD — 1800 AD	14C DATES (AD)				
				1000	1200	1400	1600	1800
PACHYORNIS	<i>septentrionalis</i>							
	<i>mappini</i>						X	
	<i>murihiku</i>							
EMEUS	<i>australis</i>							
	<i>elephantopus</i>			?	?			
	<i>huttoni</i>			?	?	?		
EURYAPTERYX	<i>crassus</i>			?	?	?		
	<i>curtus</i>							
	<i>tane</i>							
ZELORNIS	<i>geranoides</i>			?			?	
	<i>gravis</i>				?		●●●●	
	<i>exilis</i>							
ANOMALOPTERYX	<i>haasti</i>							
	<i>oweni</i>							
MEGALAPTERYX	<i>parvus</i>				?			
	<i>didiformis</i>					?		
	<i>hectori</i>					?		
DINORNIS	<i>didinis</i>							X
	<i>benhami</i>							
	<i>gazella</i>							
	<i>struthioides</i>					X		
	<i>torosus</i>							●
	<i>novaezelandiae</i>							
	<i>robustus</i>				?	?		
	<i>hercules</i>				X			
	<i>giganteus</i>						X	
	<i>maximus</i>							● ●

FIG. 2 — 27 species of moa recognised by Oliver all occur in Late Holocene deposits, 22 of them associated with human culture-sites, 16 of them in sites that have been dated with different degrees of precision.

A considerable list of carinate birds — rails, ducks, goose, swan, eagle, crow and others — became extinct in the same general period as the moas, and analysis of their subfossil occurrence (not here presented), shows that approximately 50% of them have been found in cultural association, i.e. that they survived into the human period. In addition, a number of bird species or genera became extinct over part of their range, apparently in the same pre-European period of human culture. Among them are the Takahe, the New Zealand Snipe, Kakapo and Merganser. The Tuatara (*Sphenodon*) also became greatly restricted, apparently during the early part of human occupation of New Zealand. The extinction of further bird species during the European period has recently been reviewed by Gordon Williams (1962).

There is some evidence for extinction of land and fresh-water invertebrates during approximately the same period as the more conspicuous extinction of birds. Two species of fresh-water Ostracoda and a tendipedid midge from the Pyramid Valley deposits have not yet been listed as living animals; they belong, however, to little-studied groups and it would be unwise to infer their extinction in the Holocene. Two extinct forms of fresh-water gastropods described by Cumberland (1941), are members of genera and species-groups still surviving, with a bewildering amount of variability (Dell, 1956). Such forms, in plastic evolving lineages, are extinct through modification, and their extinction differs fundamentally in origin and significance from extinction through extermination.

At least two species of marine mollusca used as food by man seem to have changed to a minor degree (at least in some districts) in the interval since the pre-European accumulation of shell middens. The pipi (*Amphidesma australe*) is appreciably larger in Wairau moa-hunter middens than in nearby harbours to-day and subfossil toheroa (*Amphidesma ventricosa*) 1030 years old, have been described by R. M. Cassie as larger than contemporary shells, possibly belonging to an extinct race (Ferguson and Rafter, 1959, p. 217). Bones of fur-seal pups as far north as Tairua (Coromandel Peninsula) suggest that marine mammals suffered local extinction before the arrival of European sealers.

Some terrestrial mollusca, like land birds, suffered restriction of range, or partial extinction, in the Late Holocene. *Rhytida greenwoodi*, a forest snail now ranging into Nelson, formerly extended to Waipara (Allan, 1937) and Hurunui (D. R. Gregg coll.) at a late Holocene date (see also Hartree on its restriction in Hawke's Bay). Extinct populations of *Paryphanta* have been recorded from shells in caves and swamps far from the localities of remaining disjunct relict populations (Dell, 1955). Similar restrictions of ranges have affected *Placostylus* and *Succinea* in Northland (Powell, several papers). Such restriction has been attributed to desiccation, but could be explained by human burning and sand-dune rejuvenation without meteorological desiccation. The changes wrought by early man in New Zealand have certainly been underestimated (see Cumberland, 1962).

Summarising, there is little evidence of early and mid-Holocene extinction, except in the case of a marine bivalve that disappeared after the Thermal Maximum. In the late Holocene, on the other hand, partial or complete extinction was a widespread phenomenon, most conspicuous in terrestrial animals, affecting both vertebrate and invertebrates, but doubtful in fresh-water organisms, unknown in invertebrates

in the sea, where however some stunting of shallow water bivalves was contemporaneous and might conceivably be due to the same causes.

At the 7th New Zealand Science Congress, held in Christchurch in May, 1951, I ventured to maintain on theoretical grounds (before there were any radiocarbon dates) that the most outstanding faunal change of the Holocene, extinction of moas and their companion species, must be attributed to the greatest ecological change in the post-glacial period — man's arrival in New Zealand (Fleming 1953). During the past decade this thesis (not by any means original but unpopular at that time) has been supported by studies of archaeologists backed by results of ^{14}C dating. On the other hand the view that effects of climatic changes, either post-glacial restriction of grassland by forest (Archey 1941) or the opposite tendency, "significant periods of drought" (Falla 1955), had more to do with their decline than human interference had persisted. Moreover, Oliver (1949) implied that orthogenetic trends contributed to their extinction, and Williams (1962) has stated that "the process could well have been going on independently of either hunting or habitat destruction." It seems we are reluctant to blame our fellow men for a pre-historic offence against modern conservation ideals and would rather blame climate or the animals themselves. The simplest explanation is to attribute all late Holocene extinction to the profound ecological changes brought about by the arrival of man with fire, rats and dogs. So far as we know, our incomplete data are not inconsistent with this conclusion.

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NOTES ON THE BIRDS OF THE UPPER NGARURORO CATCHMENT

By C. N. CHALLIES

INTRODUCTION

During the summer of 1960-61, the Forest and Range Experiment Station of the New Zealand Forest Service conducted a survey of the Upper Ngaruroro River Catchment. The opportunity was taken to record something of the existence and distribution of bird life in this region. Observations for this record were made by myself and other survey members between the dates 15/11/60 to 19/12/60 and 11/1/61 to 30/1/61. Thirty-two days in november and December, and three days during mid-January were spent in the upper Ngaruroro (north of Golden Hills) and the Taruarau head waters. Ten days in the latter half of January were spent in the mid-Ngaruroro and the Taruarau. Because of the longer time spent in the former area, observations were more complete than those in the latter. The month difference between the times of survey of the two areas could have seriously affected some results, for example, the non-recording of the Shining Cuckoo from the mid-Ngaruroro (late January) when it was most probably present, but declining in its call.

Daily records of birds seen and heard were kept throughout the survey, with notes of habitats, numbers and other relevant data. Further sources of information used were the F.R.S.S. plot-sheets and files, especially reports by P. C. Bull and R. A. Fordham.

AREA

The Ngaruroro river drains the western Kaweka and northern Ruahine ranges eastward into Hawke's Bay. The area covered by these notes consists of that part of the Ngaruroro catchment with that of the Taruarau (a major tributary) north of the Napier-Taihape (Inland Patea) road. This area approximates 260 square miles. Other boundaries are the watersheds of the Kaweka Range and the Te Puke-ohikarua Ridge to the east and north-east respectively, with the catchments of the Tutaekuri and Mohaka rivers. The complete western boundary is its watershed with the Rangitikei catchment.

VEGETATION

For easier description the area is divided into four.

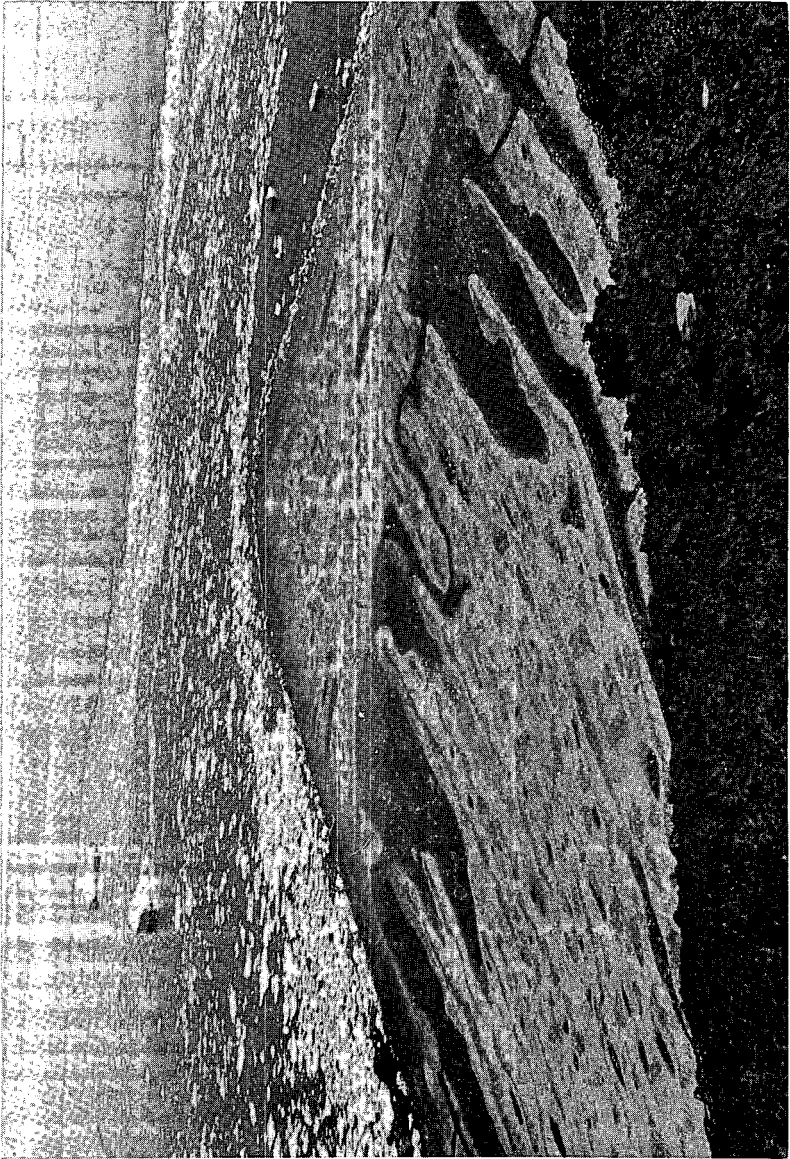
The drainage of the Ngaruroro river, excluding the Taruarau, south of and including the catchments of the Kiwi and Manson creeks. This is a uniform area of manuka/kanuka (*Leptospermum spp.*) scrub, giving way to sub-alpine scrub with tussock, and open ground at higher altitudes and on exposed ridges. Scattered islands of forest exist throughout, being dominantly Mountain Beech (*Nothofagus solandri var. cliffortioides*) often with Red Beech (*N. fusca*); and a patch of podocarp forest in Boyd's Bush.

The Rocks Ahead and Omarukokere catchments extending westward across the Ngaruroro river to the head of the Taruarau is an area predominantly of forest. This is of mountain beech, with some Red Beech on the lower valley slopes. Several small tops areas, over 4600ft. in altitude, have a stunted sub-alpine vegetation with some tussock, e.g. summit of Mt. Mangaturutu.



[Photo by Rodger Blanshard

IX — Kaka (*Nestor meridionalis*) on Little Barrier Island.



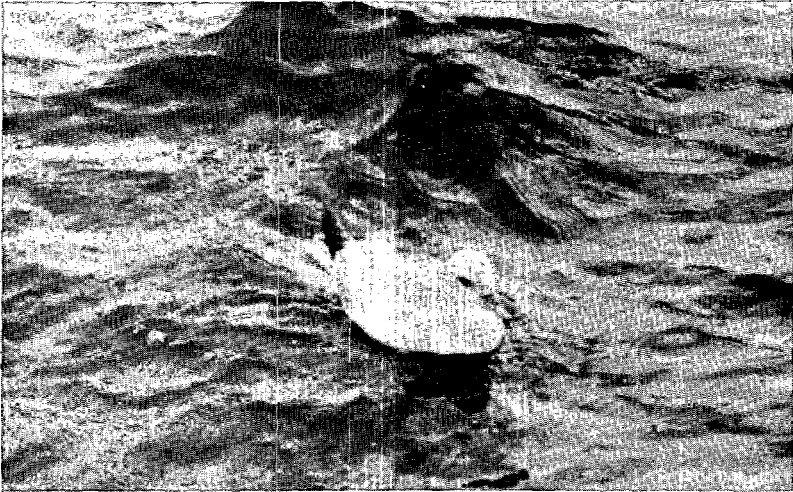
[Photo by B. Reid

X — Ridley Beach, Cape Adare, showing the ponds and Adelie colonies in the main (Zone 'a') area of the beach. The colonies are the darker areas on the light (guano covered) ground.



[Photo by R. H. Taylor

XI — Trail in snow of an Adelie Penguin that ceased tobogganing and started to walk. Adelies toboggan by sliding on their breasts and pushing themselves along with alternate strokes of their feet, and sometimes also with their flippers. When they walk the tail drags. Notebook for scale measures 7.25 x 4.75 inches.



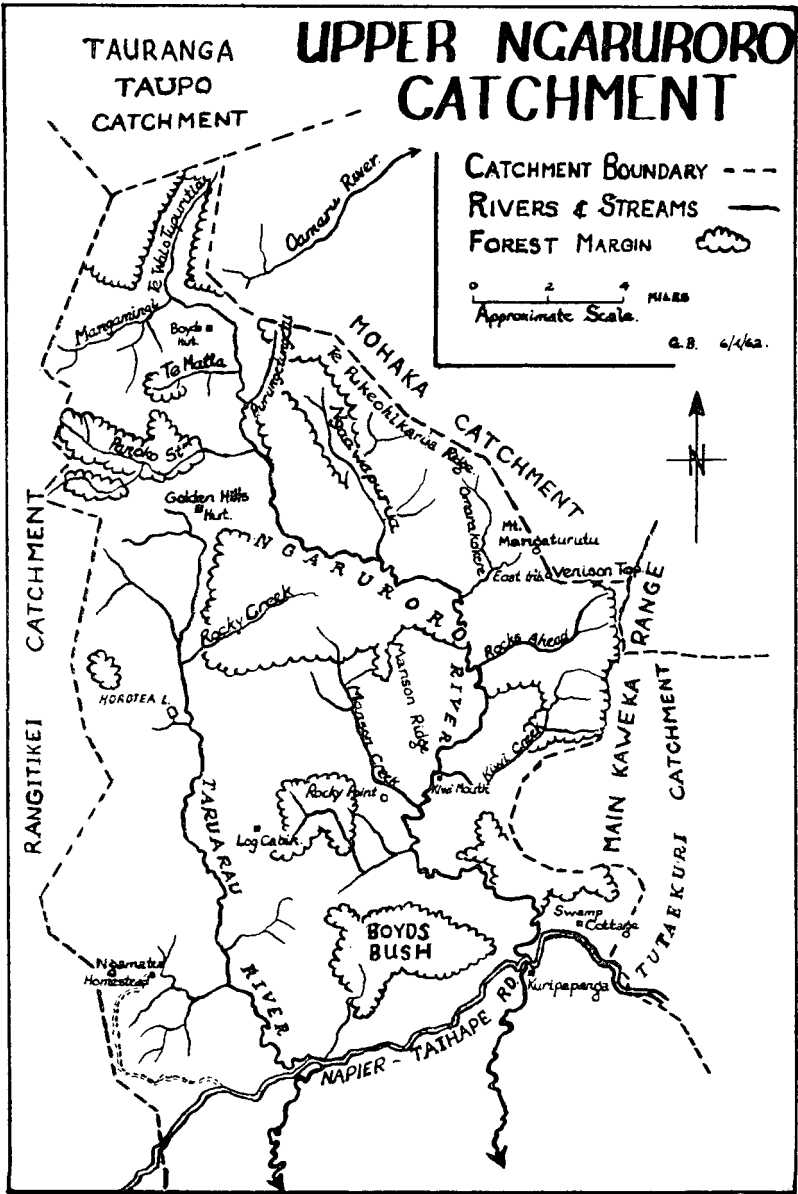
[Photo by David Blanshard

XII (a) — Southern Fulmar or Silver-grey Petrel (*F. glacialisoides*) in attendance on the Ikaterere off C. Runaway in the Bay of Plenty, 23/8/62. This seems to be the northernmost living record of this petrel in New Zealand coastal waters, where it is seldom reported at all.



[Photo by Rodger Blanshard

XII (b) — A young Brown Teal (*A. chlorotis*) about four days old, one of a brood of four found on Little Barrier beside Te Waikohare Stream, 21/9/62.



The Ngaruroro head, north of the previous area and including the Panoko valley, is characterised by *Danthonia* tussock-covered valley and river terraces. Mountain Beech forest occupies most of the mid-valley slopes with patches of manuka and *Dracophyllum* scrub. Tussock,

which covers most lower valley slopes, continues, in a few places, into sub-alpine vegetation growing on higher altitudes.

The Taruarau catchment is predominantly *Danthonia* tussock-covered with areas of manuka/kanuka and *Dracophyllum subulatum* scrub/tussock association is common. There is also a gradual transition, sub-alpine species of scrub appearing with altitude. A few small patches of Mountain Beech forest are present.

BIRDS

Thirty-five species were observed within this area during the 1960-61 survey and three other species are recognised as being present from other reports. Each species is listed below and described as to its observed distribution, habitat and abundance, along with any other relevant observations. Order of presentation and common names follow Fleming (1953) 'Checklist of New Zealand Birds.'

KIWI (*Apteryx sp.*) — From Mountain Beech forest near the summit of Mt. Mangaturutu, kiwis were heard calling on two nights in January. Small holes, which can probably be attributed to this bird as probe holes, were found in a small swampy area surrounded by beech forest, at the head of the Purungetungetu valley. Similar holes were also found in pumiceous soils amongst sub-alpine scrub on the top of Mt. Mangaturutu.

BLACK SHAG — Scattered recordings from the full length of the Ngaruroro river with one observation from the Taruarau river. It was usually seen in flight about a hundred feet above the water.

PARADISE DUCK — Found along the Ngaruroro river from the Te Wai-o-tupuritia to its confluence with the Panoko, and in the Taruarau from the Golden Hills to at least as far south as the Ngamatea Station homestead. In general this is the area of tussock-covered river flats and terraces. They were seen only in pairs, although relatively common.

GREY DUCK — Small numbers were seen along the whole length of the Ngaruroro river north of the Inland Patea road. Half the observations were from the gorge area of the river around Kiwi Mouth. Single specimens were also found in the Ngawaparua stream and low Taruarau. No more than two birds were found together at any one time.

It is worth noting that in the Oamaru stream (Mohaka catchment) on 15/11/60, two pairs were seen accompanied by only one and two young ducklings respectively.

BLUE DUCK — Present in the Ngaruroro river below its Panoko stream confluence and in most tributaries of this area, definite records coming from upper and lower Ngawaparua stream, Kiwi creek and Manson creek, as well as the main river. Most observations were made in fast flowing and rocky water courses through forest or scrub. An exception was those seen in the upper Ngawaparua where the stream crosses a shallow valley of *Danthonia* tussock.

AUSTRALASIAN HARRIER — Not present in large numbers, but occurs throughout the area, although few sightings were made east of the mid-Ngaruroro. More than half the records were from the area north of Golden Hills, where it was usually seen in flight over both open tops and tussock-covered valley flats.

N.Z. FALCON — Recorded only from the area north of Golden Hills, but most probably its distribution is much wider. Usually found associated with forested areas, but not at all common.

PHEASANT — Heard calling near Lake Horotea on 12/1/52 by P. C. Bull (F.R.E.S. files). Not recorded during this survey.

CALIFORNIAN QUAIL — Scattered records from the area west of the Ngaruroro river, namely Mangamingi, Panoko, Golden Hills, lower Rocky Creek, Manson Ridge and Rocky Point, each area represented by one or two birds seen or heard. Commonly seen along the Inland Patea road. Everywhere observed in areas of manuka scrub/tussock grassland association.

QUAIL (sp.?) — Several small quail were seen near Log Cabin on 28/1/61 by one survey member. These could have been Brown or Virginian Quail, although the possibility of these being a clutch of Californian Quail chicks cannot be overlooked.

BANDED DOTTEREL — Common during November and December along the Ngaruroro from the Te Wai-o-Tupuritia-Mangamingi confluence, to the Panoko stream. A few were also seen in the Taruarau near Lake Horotea. These are areas of gravel river-bed up to one hundred yards wide bounded by tussock flats.

Two young chicks were found on the upper Ngaruroro river bed on 11/12/60.

SOUTHERN BLACK-BACKED GULL — Recorded twice on the Ngaruroro river bed below Kiwi Mouth by R. A. Fordham (31/1/60 to 16/2/60). Not recorded during this survey.

N.Z. PIGEON — Found in Ngaruroro, Ngawaparua and Omarukokere to at least as far south as the Manson ridge. Scattered distribution throughout forested area, not at all common, single birds only being observed.

NORTH ISLAND KAKA — Distributed throughout the area north of a line from Rocky creek to Rocks Ahead stream (not recorded south), in all larger forested areas where it is moderately common. Most often seen in flight over upper valley slopes and occasionally over sub-alpine scrubland on the tops.

PARAKEET (*Cyanoramphus* sp.) — Most probably Yellow-crowned Parakeets, but none was definitely identified.

Scattered recordings were obtained from most large forest areas of the catchment. Calls were heard frequently in the Ngaruroro head to adjacent Oamaru valley. They were also present, but in small numbers, at Golden Hills and in the Ngawaparua, Omarukokere and Rocks Ahead valleys, Boyd's Bush and on the Manson ridge, where two birds were seen flying to remnant patches of Mountain Beech forest near the ridge top.

SHINING CUCKOO — Only recorded from north of Golden Hills, where they were heard calling infrequently. This was the area of survey for November and December. Probably present throughout the catchment, but not noted elsewhere because of a decline in their calling as the season progressed.

LONG-TAILED CUCKOO — Recorded throughout the catchment, although most often from the Ngaruroro head to Golden Hills and Rocks Ahead, where it was commonly heard calling during November and December. Usually found in beech forest, but occasionally in adjacent *Leptospermum* scrub.

- MOREPORK** — Only recorded from beech forest in the Ngaruroro head and Ngawaparua, where it was heard very infrequently.
- NORTH ISLAND RIFLEMAN** — Very numerous in all forested areas throughout the catchment, although it is not so plentiful in scrubland, and is almost absent from sub-alpine scrub and grassland. Often seen in family parties of adults and several young.
- SKYLARK** — Found in most areas of grassland in the catchment, in both valley flats and on open tops, greatest numbers being seen on valley flats.
- NORTH ISLAND FANTAIL** — Found throughout the catchment in forest, where they are present in moderately small numbers, usually frequenting the small areas of hardwood forest and scrub bordering streams.
- Of approximately forty Fantails definitely identified, all were pied.
- PIED TIT** — Evenly distributed throughout the catchment, in both forest and *Leptospermum* scrub areas, where it is common. Overall it is not as common as the Grey Warbler or Rifleman.
- NORTH ISLAND ROBIN** — A few present in the forest areas north of Golden Hills, being recorded in the Boyd's Hut, Mangamingi, and Te Wai-o-Tupuritia areas. One was seen also at the Harkness Hut site in the Ngawaparua. Not recorded in southern half of Ngaruroro catchment.
- WHITEHEAD** — Present throughout the catchment, although most numerous north of Golden Hills. Confined to forested and thicker scrub areas, where they are common.
- GREY WARBLER** — Very numerous throughout the catchment in forest and manuka scrub, but not seen in the sub-alpine scrub or open grassland. Along with Rifleman it is the commonest native bird in the area.
- SONG THRUSH** — Scattered recordings from throughout the catchment, but not at all common. Greatest numbers observed in the forest adjacent to Golden Hills hut.
- BLACKBIRD** — Found commonly throughout the catchment in forest, scrub and adjacent tussock grasslands. A few observations were also made in sub-alpine scrub. Along with the Chaffinch it is the commonest introduced bird of the area.
- HEDGE SPARROW** — Recorded throughout the catchment, but is not at all common. Most observations were made in areas of manuka/kanuka scrub, but Hedge Sparrows were seen in sub-alpine scrub on three occasions. Noteworthy of these was on top of Mt. Mangaturutu.
- N.Z. PIPIT** — Distributed throughout the catchment in areas of grassland, greatest numbers being seen on the open tops, where it outnumbered the Skylark. Overall it is in greater numbers than the Skylark.
- BELLBIRD** — Recorded from the Ngaruroro head to as far south as Golden Hills and Ngawaparua, often heard calling within this area, with one observation from Rocks Ahead. Usually associated with forest and, on a few occasions, seen in manuka scrub.
- TUI** — Observed in forested areas throughout the catchment, most records being from the Ngaruroro head. Moderately common.
- WHITE-EYE** — Present in forest and scrubland throughout the catchment, although not commonly seen or heard, but several small flocks were seen during January and February.

A nest containing five eggs was found on 2/12/60 in the Te Wai-o-Tupuritia.

GREENFINCH — Recorded in the Taruarau (1952) by P. C. Bull, and at Swamp Cottage during the 1959-60 survey by R. A. Fordham (F.R.E.S. files).

Not recorded during 1960-61 survey.

GOLDFINCH — Seen only once in the upper Ngaruroro, this was seen on the valley floor of the Te Matia amongst manuka scrub. Found at Swamp Cottage during the 1959-60 survey by R. A. Fordham.

REDPOLL — Relatively common throughout the catchment in scrubland, especially in areas of manuka-tussock grassland association. Usually observed in small flocks.

CHAFFINCH — Present throughout the catchment, being one of the commonest introduced birds. Most often found in forest and scrub.

YELLOWHAMMER — Present in small numbers throughout the catchment, most records being from tussock river flats and valley bottoms. One bird was reported from sub-alpine tussock/scrubland on Mt. Maungorangi at the head of the Te Wai-o-Tupuritia valley.

STARLING — Flocks of 10+ were observed on two occasions during late November in flight over the Te Wai-o-Tupuritia valley flats. They were not seen anywhere else in the catchment.

MAGPIE (*Gymnorhina sp.*) — Present in the Taruarau from Golden Hills south, but in very small numbers. Two regularly seen from Golden Hills hut. One was also seen on the Manson ridge.

KAKAPO — Possible evidence from the Ngaruroro.

The northern Kaweka range and upper Ngaruroro catchment borders upon the area suggested by Williams (1956) as the most likely to harbour the Kakapo, if in fact this species does still survive in the North Island.

During the night of 12-13/1/61, two survey members, J. A. Mabbett and I. T. Trotman, while camped in the Omarukokere valley, awoke to hear a series of approximately five booms, as of a drum. Could these booms, as heard, have been the drumming or booming call of a Kakapo?

The over-night camp was at between 3000 and 4000 feet in the east tributary of the Omarukokere valley. N.N.W. of Venison Top. This is a forested area; pure mountain beech covers the upper valley slopes with, below 3700 feet, a predominance of Red Beech. Valley sides are generally steep with a number of small undulating top areas at 4600 feet, covered with low alpine scrub and traces of *Danthonia* tussock.

This evidence for the presence of Kakapo is meagre, but worthy of note.

ACKNOWLEDGEMENTS

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A NEW POLICY

The non-appearance of Classified Summarised Notes will be noted with regret by some readers and contributors. The Council's decision to dispense with these notes in the form in which they have appeared since 1940 is based on several considerations.

(a) In some ways they were a sign of immaturity. Often they were repetitive and the spread was uneven and did little to increase our knowledge of the distribution of certain lesser-known species.

(b) The bulk of the valuable migration records appear in Annual Locality Reports, which are retained and which it is hoped will be extended to cover other districts where migration is a worthwhile study. In this issue we welcome the first A.L.R. for the Waimakariri estuary.

(c) The records of storm-wrecked seabirds now go into Beach Patrol Reports.

(d) With the great increase of material awaiting publication, the space can be better used.

(e) Accounts of rare birds or observations, e.g. on behaviour or change of status, deserve mention in Short Notes, which appear quarterly.

(f) Although C.S.N. will no longer be published as such, there still exists the need for continuous and active collection of field notes. A recording scheme is being inaugurated under which all items of information which are received but not published as Short Notes, will be listed and filed by species, and so preserved for future reference and use by those who are working on studies of individual species.



ANNUAL LOCALITY REPORTS

FIRTH OF THAMES

- BLACK SHAG — Always some. 48 on winter census on 24/6/62.
- WHITE-FACED HERON — Now likely to be seen anywhere from Kaiaua to Waitakaruru. 24 on 11/1/62. 24 inland on farm (A.T.) on 24/6/62.
- BLUE REEF HERON — 1 on 10/1/62; 2 at Kaiaua on 2/46/62.
- ROYAL SPOONBILL — 1 seen many times at Miranda between 24/6/62 and 22/9/62.
- PARADISE DUCK — 1 male at Miranda pools on 22/9/62.
- SHOVELER — 8 on 31/12/61; 13 on 9/5/62; 30 on 24/6/62.
- GRAY TEAL — 2 at Miranda pools on 31/3/62, first record for this district.
- S.I. PIED OYSTERCATCHER — 134 on 11/1/62; c. 1200 on 11/3/61; 900+ on 31/3/62; 800+ on 24/6/62; 400+ on 19/8/62; c. 250 on 22/9/62.
- VARIABLE OYSTERCATCHER — 1, smudgy, on 22/9/62. 1 black, frequently.
- ASIATIC GOLDEN PLOVER — c. 90 on 26/11/61 on ploughland at Waitakaruru, one being exceptionally black for the time of the year. c. 60 at Kairito on 31/12/61; 78 on 31/3/62, 20 being in full black and 14 in partial black.

- BANDED DOTTEREL** — Only 4 breeding pairs located. On 14/10/61, 2 nests had 3 eggs each and 1 pr. two small chicks. 8 on pools, 31/12/62 and 90+ at Kairito; 30 at Kaiaua and 20+ at Kairito on 11/1/62; 62 on 24/6/62; 17 in flock on 19/8/62.
- RED-BREASTED DOTTEREL** — Nest 3 eggs at Kaiaua on 14/10/61. 1 pr. + 1 young on 11/1/62 and still together on 11/3/62. 11 in close-cropped "mushroom" paddock on 31/3/62, the biggest flock yet recorded on this coast. At least 3 pairs on different territories on 22/9/62.
- LARGE SAND DOTTEREL** — 1 with Wrybills in Kairito marsh on 26/11/61 (A.T.) and at Kairito creekmouth on 6/12/61, 31/12/61 and 10/1/62.
- WRYBILL** — Many summered. 60 on 27/10/61; c. 90 at Kairito on 26/11/61 and c. 120 on 6/12/61. Big increase by end of year c.550 on 31/12/61; 2800+ on 10/1/62; 3000+ on 31/3/62; 1900+ on 24/6/62; c. 2000 on 19/8/62; c. 500 on 22/9/62.
- LONG-BILLED CURLEW** — 8 on 27/10/61 at Waitakaruru; 26 on 26/11/61 at Kairito; 20+ on 24/1/62; 10 on 31/3/62 evidently stayed to winter, viz. 10 on 24/6/62 and 19/8/62. 16, fast asleep and looking lean and weary on the beach at Kaiaua on 9/9/62, were probably newly-arrived migrants. 19+ on 22/9/62 on their favourite mudflat among the Miranda mangroves.
- BAR-TAILED GODWIT** — 6000+ at Waitakaruru on 26/11/61. 2700+ inland at Waitakaruru during a very high tide on 11/3/62. Only 243 on coast on winter census, 24/6/62; but a few hundred may have been inland; c. 650 on 19/8/62, rather too early for new arrivals.
- ASIATIC BLACK-TAILED GODWIT** — 2 at Miranda reddening on 21/3/61. 1 pale on 31/8/61; 2 throughout summer; feeding in swamp among Stilts on 26/11/61; flying high at Kaiaua on 11/3/62; 1 at Kairito on 31/3/62; 1 at Miranda on 22/9/62.
- TEREK SANDPIPER** — Waitakaruru-Kairito, 2 on 26/11/61; 1 on 6/12/62; 2 on 10/1/62; 1 on 31/3/62; 1 on 9/5/62.
- TURNSTONE** — c. 50 at Kairito on 25/10/61; c. 55 at Miranda creekmouth on 6/12/61; 65+ on 31/12/61; 47 on 11/1/62; 4 on 9/5/62; 3 on 24/6/62.
- KNOT** — c. 4000 at Waitakaruru creekmouth on 26/11/61 and 3100+ inland on 11/3/62, with Godwits and Stilts. 78 on winter census 24/6/62.
- SHARP-TAILED SANDPIPER** — 31/8/61, 1 on Miranda pools, seemed tired, still largely in breeding plumage; 4 on 14/10/61; 3 at Kairito on 25/10/61; some at Waitakaruru on 26/11/61; 6+ at Kairito creekmouth on 6/12/61; 4 on 11/1/62; 1 at Kairito and 9 on Miranda pools on 31/3/62, one being very richly marked.
- CURLEW SANDPIPER** — 1 near Waitakaruru on 27/10/61; 4+ on 26/11/61 and 6/12/61. 8 on 8/1/62 (1 red) on 31/3/62; 1 in virtually full breeding dress on 9/5/62 — an interesting date. Evidently 3 wintered, being seen on 19/8/62 and 9/9/62 at White Bridge and Miranda pools. These sandpipers were often, but not invariably,, associating with Wrybills.
- RED-NECKED STINT** — A poor year. 3 at Kairito on 6/12/61; 2 on 11/1/62; 1 on 31/3/62, 9/5/62, 24/6/62 and 22/9/62, always with Wrybills.

- PIED STILT** — Small breeding colonies tend to become more widespread. c. 335 birds on 31/8/61 from Kaiaua to Kairito included 200+ non-breeders; c. 990 on 11/1/62; 1600+ on 11/3/62 and inland at Waitakaruru with Godwits and Knots c. 5000. Only c. 1200 on 24/6/62 near the tide-line. 6 nests with eggs seen on 19/8/62. 1 "near-black" on 10/1/62.
- BLACK-BACKED GULL** — Increasing ominously. Limeworks, 16 nests under construction, no eggs, on 25/10/61; 10 with 3 eggs, 6 with 2 and 4 with 1 on 26/11/61. Kairito, nesting earlier; 66 nests on 25/10/61, including 8 x c/3, 6 x c/2, 7 x c/1. On 13/11/61 some nests had very young chicks. c. 120 adults over Kairito nesting-bank on 19/8/62.
- BLACK-BILLED GULL** — c. 320 on 31/8/61; 16 on 14/10/61; c. 100 on 11/3/62; c. 120 on 31/3/62; c. 230 on 24/6/62; 180+ on 19/8/62; c. 100 on 22/9/62.
- CASPIAN TERN** — A few non-breeders over the summer. Kaiaua to Kairito, 16 on 11/1/62; 60 on 11/3/62. Winter census, including Thames, 78.
- WHITE-FRONTED TERN** — 6 on 31/8/61; 15 on 14/10/61; 500+ at White Bridge with 100+ eggs on 31/12/61. Only 42 on 11/3/62, of which 3 were mottled juv. c. 50 at White Bridge and 60 at Kaiaua (2 juv.) on 31/3/62. 12 (1 juv.) on 9/5/62 at Kairito and 40+ at White Bridge; c. 20 only on winter census 24/6/62. c. 500 at White Bridge on 19/8/62. 0 on 22/9/62.
- LITTLE TERN** (*S. albifrons*) — 7 with waders at Waitakaruru creek-mouth on 26/11/61; 2 hovering over shallows at Kairito on 6/12/61; 5 on 31/12/61; 6 on 10/1/62. 2 in typical breeding dress among Wrybills on 31/3/62 (v. *Notornis* X, 91-92).
- WHITE-WINGED BLACK TERN** — 1 in fine feather, elegantly coasting, at Waitakaruru creekmouth on 26/11/61; inland with 10000+ waders on 11/3/62; and still in breeding dress over green sodden paddocks near Kairito on 24/6/62.
- KINGFISHER** — 50 counted, mostly on wires between old limeworks and hot springs on 9/5/62.
- FERNBIRD** — Survives in salt marsh scrub along ditches between Miranda and Hot Springs (P.D.G.S.).

H.R.McK., R.B.S.

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MANUKAU NORTH — OTAHUHU, MANGERE, PUKETUTU, IHUMATAO

Important ecological factors affecting the numbers and movements of birds in northern Manukau were:—

- (a) Now that little industrial waste is going into the harbour above the bridge, the water is cleaner. Caspian Terns and Little Shags have returned in strength, but the mudflats may actually be a less nutritious feeding ground for Pied Stilts and gulls.
- (b) The Puketutu oxidation ponds for the most part are a barren expanse of deep unsavoury water; but a lowering of the level at No. 4 enabled a few Pied Stilts to breed and many waders to return to a former favourite roost and feeding ground. No. 4 seems to be the only pond attractive to ducks.

- (c) The rough earthworks around the edge of the new airport runway, now extended far across the inter-tidal sands, were much used by waders as a high-tide roost; and one of the two pairs of Red-breasted Dotterels which took up territories may even have bred successfully.

WHITE-FACED HERON — Often now seen at Harania Ck. max. 9 on 11/6/62; and inland at Self's Crater-lake, obviously breeding locally. 12 at Ihumatao on 24/2/62 now quite typical.

BLUE REEF HERON — Odd birds frequent Puketutu, Ihumatao and the outer causeways.

BLACK SWAN — On the four oxidation ponds confined mostly to No. 4 (Spoonbill Pool) e.g. 75 on 13/1/62 and c. 70 on 13/10/62.

GRAY TEAL — All reports are from Spoonbill Pool. c. 20 on 29/12/61; 8 on 13/1/62; 8+ on 4/5/62.

SHOVELER — Usually some on Spoonbill Pool. 7 males on 3/11/62 looks hopeful.

S.I. PIED OYSTERCATCHER — None reported this year near Mangere Bridge or Tararata Ck. Small numbers visited Spoonbill Pool shallows e.g. 7 on 29/12/61; 35 on 13/10/62. Big flocks commonly in autumn and winter off Ihumatao and at airport, e.g. c. 1200 on 22/7/62; 150 on 31/10/62.

VARIABLE OYSTERCATCHER — 1 all black on airport on 17/9/62.

BANDED DOTTEREL — The only reports are of 167 on 4/5/62 and 6 on 20/6/62 in a corner of Spoonbill Pool, when part of the former Chinky Spit was above water level again.

RED-BREASTED DOTTEREL — All reports are from near the end of the airport, where from 26/7/62, 2 prs. appeared to have taken up territory on rough ground; but by 17/9/62 this had been bulldozed and levelled; and 1 pr. was actually running round on a newly laid and tar-sealed runway. The two pairs and a fifth very pale bird were present on 3/11/62.

WRYBILL — The only Puketutu records are of 1 on 4/5/62 and 1 on 20/6/62 on Chinky Spit. At full tide a big flock sometimes resorted to the new airport, e.g. c. 1300 on 22/7/62 (including perhaps many Karaka birds); c. 550 on 1/8/62 and 18/8/62; c. 300 on 17/9/62; 0 on 3/10/62.

LONG-BILLED CURLEW — One seen in autumn '62 over Middlemore in one of the many flights of godwits which flew across the isthmus (N.J.L.).

ASIATIC WHIMBREL — One at Harania Ck. on 31/10/61.

BAR-TAILED GODWIT — c. 1500 on 17/11/61 at Harania Ck. 2000+ on 1/12/61; 650+ on 13/10/62. As usual none seen above Mangere bridge in winter, where many fed throughout summer. Spoonbill Pool, 2500+ on 29/12/61; 5500+ on 13/1/62; 550 on 4/5/62; c. 4000 on 3/11/62. Airport, c. 900 on 22/7/62; c. 650 on 17/9/62.

TURNSTONE — 5 at Spoonbill Pool on 4/5/62.

KNOT — c. 50 at Tararata Ck. on 16/11/61. 1000+ at Harania Ck. on 1/12/61. c. 100 at Spoonbill Pool on 29/12/61 and c. 750 on 13/1/62. In winter some hundreds visited the airport, e.g. 550+ on 26/7/62; c. 400 on 19/8/62.

PIED STILT — Breeding again took place on Spoonbill Pool at the same Puketutu bays as in 1959 (v. A.L.R. IX, 98). Here 3 prs. were on territory and a nest with 3 fresh-looking eggs was found on

16/11/61. Along the old causeway 3 prs. each had two flying young on 2/12/62. Inland breeding may have been attempted at Self's crater-lake in mid-October. Summer census of upper Manukau, c. 1250 on 10/12/61; winter census on 22/7/62, c. 2300; but by then numbers had declined. Especially attractive over the summer and autumn was Spoonbill Pool, viz. 1000 on 29/12/61 and 13/1/62; c. 3000 on 4/5/62. Numbers at Harania Ck. were generally smaller, max. 500+ on 1/12/62 and in early January '62 — but opposite at Te Papapa and Waikaraka there were c. 2000 on 25/6/62.

RED-BILLED GULL — Winter census in upper Manukau on 22/7/62 was 12,100, of which more than half were at the oxidation ponds.

CASPIAN TERN — Summer census 207 on 10/12/61; winter census 81 on 22/7/62. Many more frequented Harania Ck. than have been recorded there before. e.g. 6 on 31/10/61, 30 on 17/11/61; 26 on 1/12/61 and c. 20 throughout autumn and winter; 5 on 5/11/62. Spoonbill Pool, 50+ on 29/12/61; 120+ on 24/2/62. Ihumatao, 20 on 1/11/61; 20+ on 24/2/62. Airport, 39 on 22/7/62.

WHITE-FRONTED TERN — 2 over Middlemore on 11/11/61 (M.J.H.) passing from upper Manukau to Tamaki and 2 high over Harania Ck. on 17/11/61 heading westwards.

— R.B.S., P.D.G.S.

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MANUKAU SOUTH — KARAKA - PUHUNUI

GANNET — Only 4 on census 22/7/62.

LITTLE BLACK SHAG — 18 at Pollok Spit on 22/7/62.

GREAT WHITE HERON — 1 at Weymouth on 12/10/62.

LITTLE EGRET — 1 at Weymouth first week of July and 11/10/62.

WHITE-FACED HERON — 81 on 10/12/61; 26 in Higham's marsh on 8/7/62.

BLUE REEF HERON — 3 at Waipipi on 10/12/61.

SHOVELER — 15 at Higham's on 22/7/62.

S.I. PIED OYSTERCATCHER — 600+ 8/10/61; 480 on 27/11/61; 2700 on 10/3/62; 1745 on 22/7/62, when census of all Manukau was 3025; 800 on 20/8/62; 500+ on 6/11/62.

VARIABLE OYSTERCATCHER — 1 smudgy on 23/10/61; 1 black on 23/9/61 and throughout summer and winter at least till 8/7/62.

ASIATIC GOLDEN PLOVER — Some present all summer. 24 on 10/12/61; 40 on 28/3/62; mostly in fine nuptial plumage.

BANDED DOTTEREL — c. 40 on 30/8/61; 8 non-banded juveniles (late young of last season?) on Kidd's marsh on 8/10/61; 2 nests each with 3 eggs on shellbanks on 23/10/61; c. 10 and 2 well-grown chicks on 27/11/61; 13 on 10/12/61; c. 20 on 7/1/62; 80+ on 6/4/62; 62+ at Higham's and Kidds', 190+ at Seagrove on 8/7/62; 42 on 20/8/62 divided between Kidd's and Higham's.

RED-BREADED DOTTEREL — 2 prs. with nests, each with 2 eggs on 23/10/61; some eggs hatched and young appear to have been reared. 8 on 11/3/62; 6 of which were feeding among Banded Dotterels on short grass in Kidd's marsh; c. 12 on 5/4/62. 9 at Seagrove on 8/7/62. 12 between Kidd's and Higham's on 22/7/62. 8 on 20/8/62, 3 being well-coloured. 2 prs. on territory, 1 nest with 2 eggs, on 7/10/62.

WRYBILL — Still plentiful in September, e.g. 600 on 10/9/61, and 350 on 30/9/61; 130+ on 8/10/61; 50 on 23/10/61; but only few are known to have summered. 12+ at Puhinui on 15/11/61 and 18 at Kidd's on 27/11/61; 24 on 10/12/61. After Christmas numbers soared. 213 on 29/12/61; c. 460 on 7/1/62; c. 900 on 10/3/62 and 283/62; c. 500 on 6/4/62; 600 on 8/7/62; c. 360 on 22/7/62, when census of all Manukau was 1660. 220 on 20/8/62.

LONG-BILLED CURLEW — 2 on 10/12/61, 1 on 11/2/62; 1 on 22/7/62.

BAR-TAILED GODWIT — 9000+ on 23/10/61. 3400 at Puhinui on 15/11/61. Summer census for all Manukau, 12,430 on 10/12/61 of which 7380 were along southern shore. 4100 on 10/3/62; c. 300 on 6/4/62; 340 on 22/7/62 when census for all Manukau was c. 1380. 270+ on 20/8/62.

HUDSONIAN GODWIT — 1 at shellbank on 6/4/62; 1 at Seagrove on 8/7/62.

TURNSTONE — 126 on 30/8/61; c. 230 on 23/10/61; in good numbers, c. 300 all summer; c. 250 on 6/4/62, mostly in fine colour; only 2 on winter census on 22/7/62; 12 on 11/8/62.

KNOT — c. 60 on 23/10/61; c. 1500 on 7/12/61; 800 on 10/12/61, c. 2600 on 10/3/62; 100+ on 6/4/62; 1 only on 8/7/62.

SHARP-TAILED SANDPIPER — 1 in Kidd's marsh on 29/10/62 and on following days.

AMERICAN PECTORAL SANDPIPER — 1 in Kidd's marsh on 29/10/62 and on following days. These two sandpipers, when first seen, were feeding rapidly only a few feet apart. (H.R.McK., A.T.E.).

RED-NECKED STINT — 10 on 27/11/62; 12 on 5 & 12/12/61; 9+ on 7/1/62; 10 on 10/3/62; 7 on 28/3/62; (1 red, 5 reddening, 1 pale); 1 wintered, seen on 8/7/62 and 20/8/62; 2 on 7/10/62, one in worn breeding dress.

PIED STILT — Oakland's Rd. pool. c. 90 on 8/10/61; 4 small downy young seen. Scattered pairs now breed about the south Manukau countryside. Winter census, 1265, when total for all Manukau was c. 3600, on 22/7/62.

ARCTIC SKUA — 2 on 22/12/61, chasing White-fronted Terns, just off the shellbank; 1 on 6/4/62.

CASPIAN TERN — 70+ on 8/10/61; 62 on 22/12/61; c. 170 on 22/7/62, when winter census of Manukau was c. 250; 120+ on 11/8/62.

WHITE-FRONTED TERN — A few at shellbank in Kidd's Bay on 23/10/61. Egg-laying began about 25/11/61, 3 eggs; c. 80 birds and 7 eggs on 27/11/61; c. 150 birds and 32 eggs on 7/12/61; 62 nests and 65 eggs on 10/12/61; 300+ birds and many nests on 22/12/61; 14 chicks and 108 eggs on 29/12/61; but the colony failed again, contributing factors being big tides and robber gulls. None on winter census 22/7/62; 2 on 20/8/62.

PUKEKO — Breeding freely along drains and ditches.

MANAWATU — (a) RANGITIKEI ESTUARY

GIANT PETREL — 1 seen offshore on 26/4/62.

FAIRY PRION — 1 flying close along shore on 17/3/62.

SOOTY SHEARWATER — c. 12 flying back and forth offshore on 17/3/62, not going in any specific direction.

GANNET — Odd birds fishing in summer and autumn; 1 on 2/1/62, 3 on 17/3/62, 2 on 26/4/62.

BLACK SHAG — Present throughout year, reached maximum in March; 24 on 17/3/62.

LITTLE SHAG — Highest counts 9 on 17/3/62 and 25/4/62.

WHITE-FACED HERON — About 3 or 4 throughout the year in the estuary proper, others further up river.

GREY DUCK AND MALLARD — More Grey Ducks than usual in the autumn influx: 120 Grey Ducks and 30 Mallards on 17/3/62.

The Grey Ducks had nearly all departed by 25/4/62, and by 17/3/62 only 10 Mallards and 1 Grey Duck remained.

GREY TEAL — 2 on 17/3/62, the first in this district for some years.

HARRIER — Usually 1 or 2 ranging about the estuary.

PUKEKO — Rarely seen, 1 on 25/4/62; commoner up river.

S.I. PIED OYSTERCATCHER — The first seen for 18 months arrived during January or early February; 4 were seen on 20/2/62; 7 on 17/3/62; 4 in April and finally 6 through June, July and to 29/9/62.

N.I. (VARIABLE) OYSTERCATCHER — Pattern similar to last year: About 14 through December 1961 to March 1962; 27 on 26/4/62; 17 on 14/7/62; 2 on 29/9/62.

GOLDEN PLOVER — 7 present by 28/10/61; 11 on 2/1/62; 4 on 17/3/62, one in full breeding plumage; none on 25/4/62; 2 in eclipse plumage back by 29/9/62.

BANDED DOTTEREL — Pattern similar to last year, with maximum of 130 on 20/2/62; winter population maintained till June (112 on 17/6/62).

WRYBILL — 1961 winter population had decreased to 3 by 28/10/61, and none on 22/12/61. Return migration commenced by New Year, with 3 on 2/1/62, 17 on 20/2/62; winter population of 22 through March to June, decreased to 10 by 29/9/62.

ASIATIC WHIMBREL — 1 present from 22/12/61 to 17/3/62.

BAR-TAILED GODWIT — Smaller numbers than over the last two years: summer population reached maximum of 45 in December-January. During 1961 the river changed its course slightly, apparently somewhat reducing the area of mudflat, and with it the food supply. This may have affected a number of bird species. 35 on 20/2/62 and 17/3/62; 3 on 26/4/62; first return migrants, all in eclipse plumage, 16 on 29/9/62.

KNOT — 8 on 28/10/61, 1 on 2/1/62; no others seen during the year.

SHARP-TAILED SANDPIPER — 2 on 28/10/61; none seen since.

RED-NECKED STINT — 1961 winter population of 2 increased to 3 on 28/10/61, 6 from 22/12/61 to 20/2/62, when 2 were reddening on the foreneck; 1 on 25/4/62, none remaining through the winter. 3 had returned by 29/9/62, all in eclipse plumage, roosting with Wrybills.

PIED STILT — c. 15 on 28/10/61, 35 on 22/12/61; increasing to a maximum of 85 on 26/4/62, representing an increase on the previous two years' winter populations; 75 on 17/6/62; reduced to 20 on 14/7/62, 4 on 29/9/62.

SKUA (Sp?) — 1 harrying terns offshore on 17/3/62.

BLACK-BACKED GULL — Most remain on the coast; of c. 100 on 14/7/62, nearly all were on the beach or fishing at the rivermouth.

RED-BILLED GULL — 1 on 25/4/62, 4 on 17/6/62.

BLACK-BILLED GULL — Few present throughout most of the year, reaching a maximum of c. 100 on 17/6/62. None seen on 29/9/62.

BLACK-FRONTED TERN — 1 on 17/3/62 and 26/4/62.

CASPIAN TERN — No evidence of breeding anywhere on this coast, and numbers are generally lower in the breeding season; maximum this year, 16 on 26/4/62.

WHITE-FRONTED TERN — Some present on most visits from January to July. Highest count 650+ on 20/2/62.

— I.G.A., M.J.I.

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(b) MANAWATU ESTUARY

GIANT PETREL — 2 fishing around bar on 7/10/62.

ROYAL SPOONBILL — None seen during summer 1961-62 till 24/2/62 when 4 were present; 10 on 25/3/62, increasing throughout April to a maximum count of 31 on 6/5/62. This probably represents more than half of the New Zealand population. Some of these moved elsewhere, as only 14 were present from 20/5/62 to 4/6/62. An apparent gradual southward movement was initiated about July, as 18 were present on 14/7/62 and 4/8/62; thereafter numbers fell to 15 on 26/8/62, decreasing throughout September to 2 on 29/9/62.

GREY DUCK & MALLARD — Highest count, 8 Grey Duck and 125 Mallard on 4/6/62.

SHOVELER — 6 on 4/6/62 is the only record this year. Commoner on the coastal lakes, where they breed.

HARRIER — One or two resident pairs take their share of the rabbits and of carcasses brought down the river; but no effect on the birds, except the not infrequent flushing of flocks of waders, starlings or finches, has been observed.

S.I. PIED OYSTERCATCHER — 6 on 7/10/61, 32 on 26/12/61; higher numbers wintering than in previous years, with a maximum of 55 on 19/4/62, and little variation from February till mid-May. A slight drop to 35 in June and July. 6 on 2/9/62, 15 on 15/9/62, 14 on 29/9/62.

N.I. (VARIABLE) OYSTERCATCHER — A small group present most of the year: 8 in October-December 1961, usually about 10-13 from February through May 1962. Thereafter the group appeared to move elsewhere or disperse, probably to breed on the coast. Only 1 seen on 14/7/62, 3 on 2/9/62, 5 on 29/9/62.

GOLDEN PLOVER — Highest counts were only 23 on 26/12/61 and 20 on 24/2/62. On several visits, very few or none were seen at the estuary, and it is thought that they spent some time on the paddocks or the riverbanks further upstream. Last seen on 28/2/62, none on 25/3/62 or thereafter till mid-September. First new arrivals 4 in eclipse plumage on 29/9/62.

- BANDED DOTTEREL** — c. 70 on 26/12/61, increasing to 200 from late February to the end of March, and c. 150 through April and May; dispersing to breeding sites after this, with 90 on 4/6/62, 11 on 2/9/62, and none from mid-September except a few first-year non-breeders.
- WRYBILL** — December to June, usually 5 or more present, with maximum of 14 on 24/2/62. A few at the nearby coastal streams at Hokio (7) and Himatangi (1) on 1/9/62 were on migration, and none were seen at Hokio or at Manawatu Estuary on 2/9/62 or thereafter.
- BAR-TAILED GODWIT** — 100 on 7/10/61, 260 on 29/12/61, 200 on 28/2/62, 100 on 25/3/62, 23 on 7/4/62, and about this number through to July. 15 on 14/7/62, which subsequently moved elsewhere, as none were seen in August or early September. First Spring arrivals came between 15th and 29th September; on this latter date 41 were present, all in eclipse plumage. All arctic migrants seen at this time were in eclipse plumage and may have been one-year-olds which wintered in northern New Zealand.
- HUDSONIAN GODWIT** — 1 in December 1961, not seen subsequently.
- KNOT** — As in previous years, the spring passage population had moved on by December: 22 on 7/10/61, 6 on 26/12/61, 8 on 29/12/61; 5 on 28/2/62 were the last recorded for the season, but no full census was made in early March. The first arrivals in September 1962 were 14 in eclipse plumage on 29/9/62.
- SHARP-TAILED SANDPIPER** — 3 present from 26/12/61 to 7/4/62, by which date they had assumed very rich plumage; 5 on 24/2/62 and 11/3/62.
- CURLEW SANDPIPER** — 3 on 24/2/62, associating with Golden Plovers and Sharp-tailed Sandpipers; 1 pale, 2 assuming breeding plumage.
- PIED STILT** — There appears to be a seasonal variation in population, which in 1961-62 followed the same two-peak pattern as in 1960-61: There was a post-breeding influx in mid-summer, with 155 present on 29/12/61. The birds dispersed about February, and from late February till early April, numbers this year did not exceed 35, with only 12 in mid-March. A rapid build-up to a second peak in April (120 on 19/4/62) was followed by a stationary period until June. A decline took place during July and August. The dispersal to breeding sites has not been closely watched and the times appear to vary from year to year. An irregular up and down river movement takes place during the early phases of this dispersal. Stilts are virtually absent in September. None were seen at the estuary on 2/9/62, 15/9/62, or 29/9/62.
- SKUA (Sp.?)** — One of pale phase, observed harrying White-fronted Terns offshore near Waitarere on 24/2/62 may have been a Pomarine Skua, judging by its heavy flight and build.
- RED-BILLED & BLACK-BILLED GULLS** — No clear picture of seasonal and daily movements has yet emerged, except for the departure of most adults about September, and their return about February. Red-billed Gulls continue to outnumber the Black-billed Gulls, although the reverse is true at Rangitikei Estuary and one or two of the creek mouths on the coast. On 4/6/62, 120 small gulls were

- divided between the two species in the ratio of 5: 3. The highest mixed count this year was c. 160 on 25/3/62.
- BLACK-FRONTED TERN** — 2 on 20/5/62. No others recorded.
- CASPIAN TERN** — Maximum 25 on 24/2/62 and 25/3/62.
- WHITE-FRONTED TERN** — Present from December to May, up to 250 (25/3/62) coming into the estuary, and more on the adjacent coast (1000 on 29/12/61).

— I.G.A., M.J.I.

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WAIMAKARIRI ESTUARY

Regular observations here began in October 1961, and it is hoped they will continue for some years. This report is based on at least one visit per month.

- BLACK SHAG** — Scarce. A single bird present in March.
- PIED SHAG** — Mainly a winter visitor. Max. 6 in March and August.
- SPOTTED SHAG** — Feeds offshore and roosts at the estuary. Max. 110 in March. Few during nesting season.
- WHITE-FACED HERON** — Max. 30, in January, when many juv. were present.
- BITTERN** — 1 in January in the southern swamp.
- ROYAL SPOONBILL** — 2 on 31/12/61 perching in a tree.
- GREY TEAL** — 1 on 13/3/62; 2 on 20/4/62.
- HARRIER** — Always a few; max. 8.
- PUKEKO** — Several in the southern swamp.
- S.I. PIED OYSTERCATCHER** — Always some; min. 12 in November; max, 853 on 30/6/62. On 31/12/61 an albino with eyes, bill and legs of normal colour, was present.
- BANDED DOTTEREL** — One nest found and many young birds seen. Biggest numbers in March (195), April (151), May (167), declining to 21 in August.
- WRYBILL** — No sizeable flocks seen. 4 on 21/10/61; 2 on 31/12/61; 3 on 3/3/62; 3 on 31/3/62; 1 on 19/8/62.
- LONG-BILLED CURLEW** — One present at least from 13/1/62 to 3/3/62.
- BAR-TAILED GODWIT** — 100+ on 4/11/61; 140 on 26/11/61; c. 157 December to February; 119 on 3/3/62; 79 on 17/3/62; 19 on 31/3/62; 11 in May and June; 0 in July and August.
- KNOT** — 9 on 8/10/61 3 on 26/11/61; 3 on 3/12/61; 9 on 31/12/61.
- PIED STILT** — Scarce in spring. c. 20 on 17/12/61; numbers increasing to max. 48-52, February-May; 25 in June; 6 in July; 0 in August.
- BLACK-BACKED GULL** — At least 2 prs. bred along sandspit. Increase over autumn to max. 390 in May; declining to 36 by August.
- RED-BILLED & BLACK-BILLED GULLS** — Generally Red-bills outnumber Black-bills, especially in autumn and winter; but proportions not worked out.
- BLACK-FRONTED TERN** — Scarce or absent in spring and summer; a few in autumn; 27 in June; 9 in July; 11 in August.
- CASPIAN TERN** — Usually a few. Max. 16 in January and March.
- WHITE-FRONTED TERN** — Numbers variable. Best counts were: 216 in January; 207 in March; 202 in May; 155 in August. At least one pair nested.
- KINGFISHER** — c. 7 along the inside of the spit on 30/6/62.

— D. G. DAWSON

FIELD STUDY WEEK-END, HAWKE'S BAY 19th - 22nd October, 1962

Thirty-one members and friends took part in this most enjoyable and rewarding Field Study Course, most of them for the full three-day period. Some were Hawke's Bay residents, others travelled from Wellington, Taranaki, Taupo, Gisborne, Hamilton, South Auckland, Auckland and the Far North. The weather could not have been better, ample transport was available, arrangements for accommodation and billeting were excellent, and everything was set for a really good week-end.

As in previous Labour Day week-ends the emphasis was on bird study, but this course was perhaps unique in that the greater part of two full days was devoted to studying and counting birds on the shingle beds of two rivers, and that the principal subject for study was the recently established Australian immigrant *Charadrius melanops*, the Black-fronted Dotterel, first reported in New Zealand in 1954 by D. H. Brathwaite (*Notornis* 6, 146) and first recorded as breeding here in the 1961-62 season (*Notornis* 9, 269) by N. B. Mackenzie.

Mr. Mackenzie's home at Pakowhai was the centre of operations. For the duration of the course his packing shed was used as a conference room, and housed a most interesting collection of mounted specimens and skins. On the evening of Friday 19th members assembled for preliminary discussion of the programme of work. As very few of us had until then made the acquaintance of *C. melanops*, Mr. Mackenzie called on his son, Roderick, to describe field characters and behaviour by which the species can be distinguished from Banded Dotterel. Roderick's description was clear, concise, and would have been a credit to an experienced ornithologist five times his age.

On Saturday 20th the group assembled at 9 a.m., and proceeded to Brookfields on the Tutaekuri River where we saw a *melanops* nest and observed the breeding pair for long enough to fix clearly in our minds the diagnostic characters. This done, parties moved off to stations and patrolled their allotted stretches of riverbed, covering the Tutaekuri River as far inland as Ngaroto. In the late afternoon a party visited the estuary; no Red-billed Gulls were seen, but c. 100 Black-backed Gulls, mostly immature, c. 400 White-fronted Terns and c. 60 Black-billed Gulls were noted on the coast. The only Black-billed Gulls seen on the river beds were four birds near a bridge close to the estuary; Black-fronted Terns were absent, although a few birds are sometimes seen on the Tukituki estuary in winter.

Sunday 21st was devoted to a patrol of the Ngaruroro River as far upstream as Whana Whana, and a small party investigated the lower reaches of the Esk River. Limitations of time and available personnel prevented any census work on the Tukituki River, but this has been studied by Mr. Mackenzie and other members and results will be included in a paper on the status of the Black-fronted Dotterel in Hawke's Bay, now in course of preparation.

On Sunday afternoon and on Monday 22nd parties visited the Game Farm and Ahuriri Lagoon. Birds seen at Ahuriri included numerous Mallard and Shoveller, c. 100 Bar-tailed Godwits, c. 200 Pied

Stilts, nine Golden Plover, Bittern, nine White-faced Herons and a White Heron; the two Little Egrets which had been there until the previous week had apparently left, but on Tuesday 23rd four Royal Spoonbills remained of the nine which inhabited the lagoon and river throughout winter and early spring.

Strangers to Hawke's Bay welcomed the opportunity to observe Rooks and Black-backed Magpies, and were delighted by the abundance of Goldfinches. Very few of us had previous experience of patrolling shingle riverbeds and our host had wisely arranged that we should be broken in on the gentler conditions of the Tutaekuri before tackling the more turbulent Ngaruroro. Crossing and re-crossing the swift-flowing streams scouring their way between banks of shingle involved wet pants for all, and involuntary total immersion for two of the party, but fortunately weather conditions ensured rapid drying off between wettings and temporary discomfort was a small price to pay for the pleasure of the outings in such delightful surroundings and with such a profusion of bird life. The total count on Tutaekuri and Ngaruroro was 102 Black-fronted Dotterel, 942 Banded Dotterel and 597 Pied Stilts; unexpected sightings well up the Ngaruroro were three Godwits and three shy Canada Geese. Grey Duck, Mallard and Shoveller had broods of ducklings; of 182 Paradise Duck the greater proportion were in dark plumage, and several broods of young ducklings were noted. Small in numbers were White-faced Herons, Black and White-throated Shags; Black-backed Gulls were sparse on Tutaekuri, but in big colonies (total 2125 birds) on Ngaruroro, where nesting was just starting. Add to all this pairs of Pipits on the shingle beds, introduced and indigenous passerines singing from the river banks, the constant whistling of Shining Cuckoos, and it will be realised how pleasant and varied was a two-day exercise which was also of considerable ornithological value.

Evening meetings on Saturday and Sunday included a programme of talks, wild life films, slides, and a recording of Kokako calls made by M. G. Macdonald, and culminated in a magnificent supper kindly arranged by our host and hostess, to whom we accorded a hearty vote of thanks for a week-end made memorable by their good planning, excellent organisation and warm hospitality.

— A.T.E.



SHORT NOTES

DECLINE OF BANDED DOTTEREL AT TAUPO

In the late 1920's and early 1930's, the Banded Dotterel (*C. b. b. bicinctus*) was quite a common bird in the Taupo district from July to February, frequenting the bare pumice areas. Every year some bred on the waste ground to the east of the now disused Experimental Farm near the A.C. Baths. Here a pair with two very small chicks, only recently out of the nest, was seen on 11/11/29. About this time the farm was taken over as a golf-course of nine holes and the birds returned to breed every year until the area had been grassed sufficiently to allow an extension to eighteen holes. This reduced the area of bare ground to such an extent that it was no longer suitable as a breeding ground and the regular golfers tell me that no Dotterels have been seen there now for more than ten years.

Another area where breeding occurred was on the large waste pumice flat over which Highway No. 1 now runs between Earthquake Gully and the top of the Hatepe Hill, especially on that part of the flat over which the road to the Hinemaiaia electric power station now passes. In the late 1920's this area was almost bare pumice, having scattered about it a few low plants of Monoao (*Dracophyllum subulatum*) and an occasional clump of tussock grass, all being associated with a covering of moss and lichens — typical 'hare country.' At least two pairs of Dotterels bred here every year. On 17/12/29 six birds were seen together. Breeding pairs were often seen in this area but by 1932 they were becoming fewer with the growth of the scrub which was covering the bare places; and by 1936 Dotterels had apparently deserted the district, none being found in spite of a careful search during the breeding season.

Other areas that the Banded Dotterels used to frequent were the swamps and shingle flats at Waitahanui and the shingle beaches and banks on the western side of Taupo Bay, but I have no evidence that they bred there.

In the spring of 1961, after a gap of several years, I heard from Mr. Nicholls, officer in charge of the recently established Native Plant Nursery that has taken over part of the Spa Farm on the north-eastern bank of the Waikato River, that a pair had nested and reared young on some newly ploughed ground in the plant-nursery, about three-quarters of a mile from the golf-course. On 4/11/61 I saw the hen bird in attendance on three well-feathered chicks. They were just able to fly over a low wire fence from the rough ploughed land into a grassed field where they quickly vanished, while the hen tried to lead us away up the strip of ploughed land.

As the scrub lands are ploughed and brought into cultivation, it is possible that the Banded Dotterel population around Taupo will increase again, though they will be scattered over a far wider area.

— J. S. ARMSTRONG



COOT ON THE VOLCANIC PLATEAU

On 25/9/62 I received a phone call from Mr. W. J. Brown, stating that a strange water-bird was present near his home at Lake Okareka. His description of the stranger left no doubt in my mind about its identity, a Coot of the Australian race (*Fulica atra australis*). On September 27th, C. D. Blomfield and I went to the lake to try to see the bird. To C.D.B. must go the credit of first spotting it, as it dived, splashed and cavorted close inshore. When it swam out into deeper water and in full view at thirty yards, we were able to confirm the identification. Every time it emerged from a dive its bill was full of vegetation, which it promptly swallowed, before diving again. Several times it uttered a guttural squawk, the intonation suggesting annoyance. We believe this is the first record of the Australian Coot for this region.

— M. J. S. BLACK

MEALY-TYPE REDPOLLS IN NORTHERN NEW ZEALAND

The very interesting paper (*Notornis* X, 61-67) in which David Stenhouse draws attention to the strong likelihood that two subspecies of Redpoll, Mealy (*Carduelis f. flammea*) and Lesser (*C. flammea cabaret*) have been established in New Zealand, probably for about a century, has prompted me to look back into my notebooks. Stenhouse's diagnosis is based on specimens obtained in the South Island, at Lincoln, Alexandra and Fiordland. It would appear that Redpolls showing strong 'Mealy' characters occur also in the North Island and may indeed be breeding north of 37°S. Lat.

On 29/8/48 Mr. H. R. McKenzie and I watched a small party of Redpolls feeding on the ground in a hollow behind the top of the beach at Kaiua in the Firth of Thames. My note book says, "One male in fine plumage looked very pale, almost mealy!" We were looking down on the flock and I can still remember commenting on the paleness of its lower back which we were in a good position to see. H.R.McK's. notes significantly comment that "one was larger, scarlet-pink in front and generally lighter in colouring."

In late August and early September, 1962, when a study was being made of the natural history of the Mercury Islands, Redpolls were seen or heard daily about the camp at Peach Grove, Great Mercury. Often they fed on the ground. On September 6th a pair was closely watched under very favourable conditions by Mr. A. Blackburn and myself. The male was a strikingly beautiful bird with a rich rose-pink flush deepest on the breast; but there was an underlying paleness, and the lower flanks and belly were almost white. The main wing-bar was conspicuously whitish and the very pale edging to other wing-coverts left the impression of three white bars in the wing.

Soon after our return we consulted the Handbook of British Birds Vol. I, plate 8, and also 'The Birds of the British Isles,' Vol I, plates 18 and 19, by Bannerman and Lodge. The illustrations in both volumes confirmed our impression that the male we had watched on Great Mercury had such strong 'Mealy' characters that if not pure 'Mealy,' it must have been very nearly so. The female, too, in the contrast of tones in its plainer plumage, resembled rather the coloured figures of *flammea*, than of *cabaret*.

— R. B. SIBSON



REVIEW

Birds of the World, by O. L. Austin Jr.; Illustrations by A. Singer. Golden Press, New York, 1961.

Since the end of World War II there has been something of a spate of large and colourful books on birds, reflecting presumably a growing interest in ornithology and in birds as things of beauty, whose existence is only too often threatened by what is rather dubiously called the advance of civilisation. The present volume with its superb illustrations would be an ornament to any library of fine books; and the technical skill of the artist and the quality of the reproduction cannot be too highly praised. The author has travelled widely, is a world authority on some species of terns, was co-author of a checklist on the Birds of Japan, and has visited New Zealand.

The text, which goes considerably farther than to be merely popular, is a valuable guide to the families of birds and their world distribution and is a veritable mine of varied information. Here, for instance, we may read, as we pass from the very large to the very small, that there is renewed hope for the survival of Steller's Albatross and that the Wrens of New Zealand are related to the Pittas or Jewel-thrushes. There are notes on longevity as proved by ringing. A Curlew has lived 32 years, a Herring Gull 28, an Arctic Tern 27, a Sooty Tern 25 and a Little Tern 23.

The author is very much concerned with the impact of man on wildlife and what he reports (pages 136 and 252) on the effects of the mass-spreading of insecticide sounds a grim warning.

Of special interest to New Zealand readers are maps of the migration routes of Arctic Tern, Giant Petrel and Tasmanian Mutton-bird, though that of the last-named gives a false impression of a general swing towards our long west coast before the real northward movement begins.

To find faults in such a lordly volume may seem churlish, but it is the duty of a reviewer to examine and judge the text in the light of what is said about the birds of his own country. In such a comprehensive work there is always the danger of trying to be too concise and some errors have crept in from over-simplification or compression. Other errors of fact are less venial.

Unfortunately there are only too many statements which in the interests of truth must be challenged. Among them are:

- p. 16 "Ostriches will fight when cornered and can be mean antagonists." Surely 'no mean' is meant.
- p. 29 The Yellow-eyed Penguin is said to "nest underground in burrows or rock crevices."
- p. 32 Buller's Albatross "is confined to New Zealand waters" — but only for breeding. What has happened to the South American records?
- p. 33 Once again in naming the largest of all sea-birds, the claims of the Royal Albatross of Campbell Island are overlooked.
- p. 35 The length of the Sooty Shearwater, given as 10 inches, is an obvious misprint, especially as on p. 36 the lengths of the prions are given as 11-12 inches.
- p. 46 "Gannets are cliff-breeders." This may be true of the St. Lawrence gannetries; but it is not generally true of British or New Zealand gannets.
- p. 81 We are told there are no Harriers in N.Z. — perhaps an echo of a once widely held belief that our common harrier is an introduced bird.
- p. 110 The Takahe is said to have been rediscovered "almost a hundred years after the last live bird was taken." But from 1898 to 1948 is only fifty years.
- p. 119 To say that the Wrybill "nests on the beaches of the South Island" is misleading. "Well inland on riverbeds" is nearer the truth. Does the Wrybill "migrate sometimes in flocks of up to 700 or more"? Since the middle 1940s flocks of 1500 or more have regularly occurred in their winter quarters; but no-one has seen large flocks actually migrating, and all the evidence points to a steady build-up from small parties. They

may travel south in larger flocks. At present the only districts where large flocks of 500+ are known are the northern termini of their migration. Six inches is an understatement for the length of a Wrybill.

- p. 216 When the author wrote that Swallows were absent from N.Z. it may have been true at the time; but in view of the very successful breeding, resulting in a 'population explosion' since 1958 in Northland, the statement is fortunately untrue; and an understandable error is readily forgiven.
- p. 227 The suggestion that Saddlebacks were especially associated with 'Kauri and tree-fern forests' is picturesque but quite inaccurate. The offshore islands, where this fine species survives and thrives, are hardly notable either for their Kauris or tree-ferns.
- p. 276 "Still to be found in some of the few patches of original forest now remaining" leaves the unhappy impression that the Bellbird is a threatened species just surviving, whereas over large areas it is very plentiful and over the whole country certainly outnumbers the Tui by a substantial margin; yet the Tui is said to be "still fairly common."

"Birds of the World" is a collector's piece, boldly conceived and superbly produced, but marred by textual inaccuracies which could have been avoided by a more careful study of local information, collected and published in the last decade. A useful bibliography fills two pages.

— R.B.S.

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NOTICES

REGIONAL ORGANISERS, O.S.N.Z.

The list of Regional Organisers published in **Notornis X**, page 95, is amended as follows:—

AUCKLAND: D. F. Booth, P.O. Box 2522, Auckland, C.1 (change of address)

BAY OF PLENTY: H. D. London, P.O. Box 203, Whakatane (replaces Mrs. R. V. McLintock, left Bay of Plenty)

VOLCANIC PLATEAU (previously known as ROTORUA-TAUPO): C. D. Blomfield, cnr. Ariariterangi St. and Lake Road, Rotorua (replaces M. J. S. Black, resigned after 14 years of service to the Society)

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PROPOSED MEMORIAL TO THE LATE JAMES PRICKETT

The North Shore Scenic Board has decided to erect a memorial in the form of a stone seat near the new entrance to Kauri Park, Birkenhead, in memory of the late Mr. Prickett.

O.S.N.Z. members in Auckland and South Auckland have been circulated, those who wish to contribute to the memorial being asked to forward contributions to: Mr. D. F. Booth, P.O. Box 2522, Auckland, C.1.

Many members in districts far from Auckland will have lively memories of the fine work and kindly personality of the late Mr. Prickett, and may wish to contribute to his memorial.

O.S.N.Z. LIBRARY

New address:—

O.S.N.Z., C/o Auckland Institute and Museum, Private Bag,
Auckland, C.1**APPOINTMENT OF ASSISTANT TREASURER**

Mr. D. F. Booth, P.O. Box 2522, Auckland C.1, has been appointed Assistant Treasurer of the Society and all subscriptions should be sent to him at the above address.

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NEST RECORD SCHEME

Members are reminded that nest record cards should be sent to the Organiser, Mr. J. C. R. Claridge, 82 Mungavin Avenue, Porirua, by 28th February, 1963. Very few contributions have been received this year. Members are urged to take part in the Scheme if they possibly can. Cards and full details are available from the Organiser.

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PUBLICATIONS**Back Numbers of Journals**

As there is a steady demand for back numbers, members are asked to offer to the Society, for gift or sale, back numbers which they no longer require.

Full sets of the Journals of the Ornithological Society of New Zealand (Inc.) are now available, and incomplete sets can be made up.

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Price List

	£	s.	d.
Reports and Bulletins, 1939-42, one booklet		12	0
N.Z. Bird Notes, Vol. 1, January 1943 to May 1946, 11 parts and supplement, 3/- per part	1	13	0
N.Z. Bird Notes, Vols. II (8 parts) and III (9 parts), July 1946 to April 1950, 5/- per part	4	5	0
Notornis, Vols. IV - IX, July 1950 to March 1962, each Volume 8 parts, 5/- per part	12	0	0
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Year ending 31/3/59 — No. 9, 38 pages 5 0
Year ending 31/3/60 — No. 10, 42 pages 5 0
Year ending 31/3/61 — No. 11, 37 pages 5 0

For any or all of the above publications, please send cheque with order to:—

O.S.N.Z., P.O. Box 45, Clevedon, N.Z.

Field Guide to Waders, Condon and McGill, Second Edition, Revised 1960, Published by Melbourne Bird Observers Club, per copy 3 0

Orders and remittance to:—

A. T. Edgar, Inlet Road, Kerikeri, N.Z.