N.Z. BIRD NOTES

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CONTENTS.

INTRODUCTION.

The last number contained the report on the White-eye, and there was no space for introductory matter and reviews. These are included here. No. 7 will be the last one for the year 1943-44, and will contain the short classified notes, and No. 8 will consist of Mr. McCaskill's report on the Magpie Inquiry. This report has already been drawn up, but if anyone has any further notes it might still be possible to include them. It is hoped that members will send in short articles suitable for publication in these pages so that the editors will have material in hand to draw upon when making up the contents.

The Society gratefully acknowledges the following donations to the Publication Fund: Mrs. Lenz 15s, Mr. W. Sanderson 10s, and Miss Marriott 5s. A very generous anonymous donation of £15 was received for the purpose of acquiring extra copies of each number of N.Z.B.N. as they come out. This is an important matter, as there will always be a demand for back numbers and the first few are already practically exhausted. We also gratefully acknowledge the gift of separates of several papers, and especially for a copy of his book, "Birds of Hawaii," by Mr. G. C. Munro.

The number of members is now about 180, and we hope at least to reach 200 by the end of the current year. It is hoped that the sheet of hints to observers sent out with the annual report will prove useful

to members, and if extra copies of it, or of the printed circular can be of use in obtaining new recruits, they may be obtained from the Hon. Secretary.

REVIEWS.

The following periodicals and copies of papers have been received since those reviewed in No. 4, and they may be borrowed on application to the Hon. Secretary, together with stamps for postage:—

"*The Emu,*" Vol. XLIII, Part 2. There are three New Zealand papers. "The Kuaka, or Diving Petrel," Part 2, by L. E. Richdale. This completes the account of the life history of this bird, dealing with the adult. Measurements of 100 birds from one island and of 50 pairs from an adjacent one are compared with the published measurements of different sub-species. It is interesting to note that these are based on series of only 2–7 individuals. Clearly anyone visiting breeding grounds has the opportunity of making valuable long series of measurements without the slaughter of large numbers of birds. "The races of *Puffinus assimilis* in Australia and New Zealand," by C. A. Fleming and D. L. Serventy. This paper discusses in detail the sub-species of the Little Shearwater, of which there are five, one, *P. haurakiensis,* breeding on islands in the outer Hauraki Gulf. "Additions to the avifauna of the North Island, New Zealand," by R. B. Sibson. This paper records the occurrence for the first time in the North Island of three rare waders, the Hudsonian Godwit, Curlew Sandpiper and American Pectoral Sandpiper. They had previously been recorded in the South Island. No doubt if a watch was kept in suitable localities we should learn more of the occurrence and movements of northern migrants which reach us in small numbers.

"*The Emu,*" Vol. XLIII, Part 3. There is one New Zealand paper, "The Parara, or Broad Billed Prion, *Pachyptila vittata* (Gmelin)" by L. E. Richdale. This is another of the detailed life history studies of petrels made by this worker on an island off Stewart Island. As in his other papers, he makes extensive use of weights and measurements in studying the growth of the chick. The technique of routine weighing both night and morning is invaluable in determining the way in which the young of petrels are fed.

"*The Emu,*" Vol. XLIII, Part 4. There is one New Zealand paper, "Notes On New Zealand Birds," by G. Mathews. This is concerned solely with nomenclature and is of interest only to the systematist. "The food of cormorants and other fish-eating birds," by K. C. McKeown. This deals with several New Zealand species in Australia, and should be read by all interested in this matter. It stresses the need for accurate information in view of the often sensational statements as to the economic status of these birds. "An attempted simplification of the mathematical method of sub-specific differentiation and identification," by R. S. Miller.

SOME OBSERVATIONS ON STILTS IN THE FIRTH OF THAMES.

By R. B. SIBSON and H. R. MCKENZIE.

These observations on Stilts were made on the west coast of the Firth of Thames. From July, 1941, to October, 1942, we were able to visit this interesting stretch of wader-country at more or less monthly intervals. A road, running close beside the shore for the nine miles or so which we had under observation, enabled us to survey the area quickly and easily; and by timing our visits so that they coincided with a rising tide, it was possible to take a census of the wader population, which allowed for only a small margin of error.

In the breeding season there are three colonies, two small and one rather larger, of Stilts along this coastal strip; and for the purpose of the census, it was convenient to divide the area up into three sections adjacent to the three colonies. There is a big influx of Stilts for the winter. The coastal plain, consisting mainly of rough pasture, ends abruptly with bluffs or steeply-rising hills and varies in width between a few hundred yards and about a mile. With the doubtful exception of one or two pairs, all the Stilts' nests were within 200 yards of the shore.

The northernmost section, approximately three miles in length, centres round Kaiaua settlement, where four or more scattered pairs breed in damp paddocks less than 100 yards from the shore. Shallow pools with patches of rushes and open water which does not dry up till late summer provide an ideal habitat. The Kaiaua Stilts are quite acclimatised to the presence of human beings; and at least one pair habitually feeds in pools which are within the grounds of a small school. The foreshore is composed of big, rounded stones and pebbles, with patches of mud and sand in between. The coast here sweeps round in a wide curve, at the northern end of which, beyond a stony promontory, a clear stream splays out over the beach. At the centre of the curve a muddy creek enters the Firth; and beside this is a high bank of shingle, where White-fronted Terns have nested and in winter Stilts habitually gather at full-tide. To the south the character of the coast changes. The foreshore becomes mud and sand instead of large stones. There is also an extensive area of mangrove flats, through which a second muddy creek trickles seawards. Such, then, are the varied ingredients of the Kaiaua terrain.

The middle section of the census lies some two and a-half miles to the south of Kaiaua; and its central point is a white bridge. Ecologically, it is rather different from Kaiaua. The coastal plain is here much wider, and there are no human habitations. The foreshore is simply mud and sand without any mangroves, and at low tide its flat monotony is broken only by one prominent shingle-bank, a favourite high-tide roost for Gulls, Terns, Shags, and in winter South Island Oyster-catchers (*Haematopus ostralegus finschi*). Deposits of shell begin here to extend inland. They are covered with thin grass, and in the damper places there are clumps of *Plagianthus divaricatus, Olearia*

solandri, and *Coprosma propinqua.* Two natural features which have attracted three or more pairs of Stilts to nest here are a long, shallow, permanent pool of fresh or only slightly brackish water and a small canalised tidal river which at low tide trickles over the beach. For the purposes of the census the country half a mile north and south of the white bridge is included in the middle section.

Something over half a mile south of the white bridge colony and linked to it by a high shingle beach, behind which extend some acres of rushy swamp, is the main colony. Here shell deposits reach inland for more than 100 yards; and recent excavations by the Miranda lime works have created a chain of pools which, because they vary in length and contain many small islands, afford a wholly attractive breeding ground for at least a score of pairs of Stilts. These pools are at the northern extremity of the southernmost and biggest section. Southwards in order are a muddy lagoon nearly a mile long and covered only by the highest tides; a wide, muddy creek, with mangroves running half a mile inland; and lastly, three miles of flat, muddy coast fringed south of the creek by a belt of small mangroves and for the last mile by salicornia-covered saltings.

Owing to the intervals between our visits, we were not able to study the breeding habits of the Stilts in as great detail as we would have wished; but, nevertheless, much useful information was collected.

Adult birds begin taking an interest in their breeding grounds in July; and the antics and postures of courtship were observed on August 3. The first eggs are laid in September, and a few pairs may have complete clutches by the end of the month. Thus on September 27, 1942, three nests with eggs were found; of which only one had the full complement of four eggs. October is the main month for laying. On October 12, 1941, of ten nests visited six had complete clutches; and several other nests on which birds were sitting hard were left undisturbed.

A shallow scrape in the shingle, with or without the addition of a few bits of stick or flood-rubbish, most commonly serves as a nest. But some nests on marshy ground were built up of shells and flannelweed, pulled from the adjacent puddles; and by this provision at least one nest was saved from inundation when a sudden rise in the water ruined many eggs.

The three or four pairs at White Bridge are an offshoot from the main colony half a mile south towards Miranda. There is no doubt that they nested later than the birds in the main colony. Thus on October 12 one pair here had two eggs; on October 27 this nest contained four eggs, and on November 9 they had just hatched. In the meanwhile two more pairs had laid; and on November 30, while one brood could already fly unsteadily, a second brood were at an intermediate stage and the third brood were only a few days old. In "Bird Flocks and the Breeding Cycle" Fraser Darling, dealing mainly with seabirds, makes the point that birds in a large colony tend to nest earlier than those in small outlying colonies; and he suggests that

keener competition for nesting sites arising from the density of the population stimulates the birds sexually. It has, however, also been pointed out that the occupants of outlying colonies are likely to be young, inexperienced birds nesting for the first time. Whatever the reason, both Kaiaua and White Bridge birds were later nesting than the big Miranda colony.

Usually four eggs make up the full clutch; but one nest containing five eggs, all of same type, was found. The average measurements of five eggs from different clutches are 45 × 31 mm. The incubation period of European Stilts is given as 25-26 days; and the same seems to be true of the New Zealand subspecies. Evidently they begin to sit only when the clutch is complete. In one nest on October 27 four young Stilts, just out of the egg, were lying quite still. They had not, like the young lapwing in Hamlet, run away with the shell on their head.

Once they have left the nest, young Stilts are not easy to find, and readily resort to thick herbage to hide. Undisturbed, they frequent the water's edge, where there is an abundance of insect life hatching out. They do not leave their freshwater pools or flooded grasslands for the mudflats till they are strong on the wing.

Flocking begins in November, soon after the young Stilts are able to fly and look after themselves. On November 9 a loose mob of at least 60 birds, among which were many young, was sitting about on a grass paddock near the largest breeding pool; but no young birds had yet taken to the mudflats. Three weeks later there was a big decrease at the pools, which were beginning to dry up as summer advanced; and there was a corresponding increase on the tidal flats. Some families seem to stay on their nesting territory as long as any fresh water lasts; and as late as February 8 two pairs, one with two full-winged youngsters and the other with three, refused to move far from their favoured, albeit much reduced, pools. Even as late as this some parents are absurdly excitable and over-anxious for their quite capable young.

December and January are good months for assessing the success or otherwise of the breeding season. We estimated that during the 1941-42 season the Stilts of our three colonies on the average raised two young per pair; a remarkably good average for a ground-nesting bird with a normal clutch of four eggs, breeding in exposed country where Harrier-hawks are abundant and stoats not unknown; added to which most nests were within view of a road and men were working on an excavator near the main colony.

When we took the census on February 8, it was clear that there had been a big decrease. Two counts had been made in January, both of which had shown about 150 birds present. These were made up roughly as follows: 30-35 pairs which had bred (60-70), two flying young per pair (60-70 +) and a few non-breeders. But on February 8 only about 80 birds could be found.

There is certainly some local Stilt movement in February, if not earlier. At this season Stilts reappear in Manukau Harbour at places where they have been missing since September, and they are often heard at night calling as they fly over Mangere and Otahuhu. Much earlier than February, H. R. M. has known a flourishing colony at Clevedon to be quite deserted. Evidently when the breeding season is over, a restlessness comes over many of our northern Stilts; in a lesser degree the same feeling which makes their southern congeners migrate northwards. It can hardly be a question of climate or food supply that makes some of the Thames Stilts move away, for their places are immediately taken by plenty more.

In March the numbers begin steadily to increase, and most of the immigrants have settled in for the winter by the end of April. They keep entirely to the mudflats and beaches, over which for feeding they scatter more or less evenly. Towards full tide they mostly congregate at three or four regular resting places, but do not generally pack closely like Godwits. In the winter they do not hesitate to come up among the mangroves, though at other seasons it is not usual to see them there. Numbers begin to decline about the end of July; and a month later there are few left except the breeding pairs and some juveniles.

These non-breeding juveniles, nearly a year old, are always present in the early spring, easily distinguished by the smudgy markings still on their heads. For instance, over 60 of them were seen on September 27 feeding on the flats, while the breeding pairs were busy on their territories. It is tempting to think that they were the bulk of the young reared in this area the previous year; but it is an unverifiable conjecture. It was noticeable that while in spring 1942 there were at least 60 juveniles present, they were scarce in 1941. The explanation may be that this region in the Firth of Thames has only recently been colonised, and 1941 was the first season of breeding on such a scale. Certainly man by his excavations and consequent pool-making is rendering the area more and more attractive to Stilts.

Young Stilts have a distinctive note. It is higher-pitched than the parental yep, yep, yep; and might be syllabised as quip or kip, kip, kip. When Stilts are flying over at night and calling, it is easy to tell whether there are young birds among them. As they lose the smudgy markings on their heads, their voices "break," and in spring juveniles with husky voices are not uncommonly heard.

So far, although we have not seen a "Black" Stilt in the Firth of Thames, we have come very near doing so. When we made our first hurried visit on July 13, 1941, one was seen, which was black except for a narrow white band across its forehead and some smudginess on its underparts; and three weeks later the same bird and another, with slightly more white on it, were seen in the same creek. On March 8 H. R. M. reported that four nearly black Stilts had appeared at Miranda; and a month later we were able to note the details of the plumage of three of them, viz.: (a) Some white on the face and round

the eyes. Black coming down over crown nearly to bill. Stomach and under-tail coverts smudgy. (b) Almost the same, especially about the head, but smudgy patch of stomach much smaller, owing to more black on lower chest. (c) Very similar, but with more smudginess where black and white ran into one another.

The strip of coast which we worked is only a fraction of the area in the Firth of Thames where Stilts occur. The winter population of the flats extending along the southern shore from Waitakaruru to the Thames River runs into thousands. On April 5, 1941, we succeeded in reaching the somewhat inaccessible estuary of the Piako River, where we estimated that there were at least 2000 Stilts present. The Hauraki plains, where they border the southern end of the Firth, would not seem to afford the same attraction to Stilts for breeding as the western side; but there is reason to believe that considerable numbers nest in swamps up the rivers, which run into the Firth. On January 2 150 were counted in a riverside meadow near Waitakaruru, and on January 12 over a score at Pipiroa Ferry had resorted at full tide to an old jetty, a queer roosting place.

Some two miles north of Kaiaua a pair bred in 1941 and 1942 beside a shallow pool in a paddock just behind the beach. Their family history is rather sketchy, but we give it for what it is worth.

1941—

July 12.—One pair evidently in occupation of territory.

August 3.—Not seen.

October 12.—Very quiet. Nesting in progress.

October 27.—Very quiet. Eggs were evidently laid late.

November 30.—Very demonstrative. Probably have small young.

December 31.—One pair with three flying young. A second pair had appeared.

January.—(Evidence of local movement?)

1942—

January 13.—Missing.

February 8.—Missing.

March 8.—Missing.

April 4.—Missing.

May 3.—Missing.

June 21.—Missing.

August 23.—One pair + two juveniles. If a family, interesting that they should have kept together so long.

September 27.—One pair already with a nest.

October 18.—One pair. One on guard, one sitting hard.

1943—

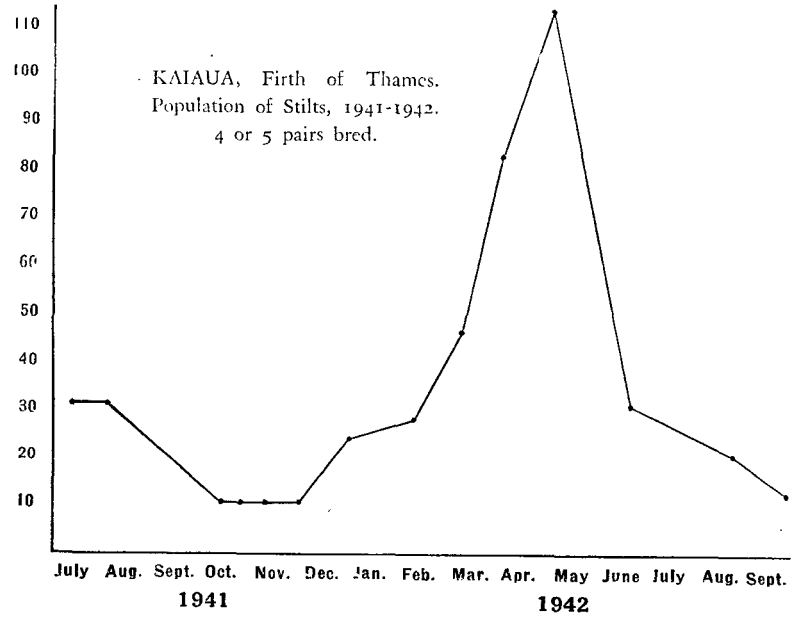
January 1.—Missing. (H. R. M.)

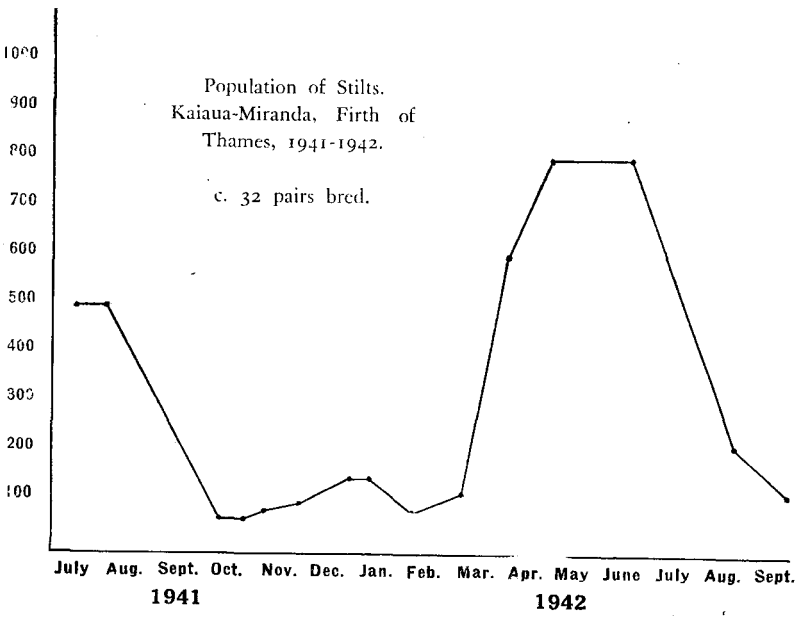
POPULATION OF STILTS.

West Coast of Firth of Thames, 1941-42.

Date.	Kaiaua.	White Bridge.	Miranda.	Approx. total.
July 13/41	c. 30.	17.	c. 450 (1 nearly black).	c. 500
Aug. 3	←c. 120	→	Hundreds (including 2 nearly black). Courtship attitudes & postures observed among birds at big pool.	c. 500
Oct. 12	4 pairs & 2 apparently single birds. (1 bird sitting hard.)	c. 14 (1 juvenile). 1 pair with 2 eggs.	c. 25 pairs breeding and a few unmated or juvenile birds. Of 18 nests found, the majority had 4 eggs. Some sitting birds were not disturbed.	c. 74
Oct. 27	4 pairs—not disturbed.	3 pairs (2 nests, each with 4 eggs; 1 pair not yet laying?).	Many nests had hatched. Away from colony were a few non-breeders.	70 +
Nov. 9	4 pairs, evidently with small young or well-incubated eggs.	3 pairs (1 nest hatched, 1 destroyed by an animal, 1 new with 4 eggs).	60 + in a loose mob, including flying young; 4 birds seen still sitting (second attempts after flooding?). Many pairs noisy with hidden young.	c. 90
Nov. 30	4 pairs. No young seen, though obviously there.	3 pairs with young, all at different stages. One brood flying unsteadily, another a few days old.	30–40, including many flying young at the breeding pools. 34 + on the mudflats.	100 +
Jan. 1/42	4 pairs with respectively 2, 2, 2, 3 flying young. Also a party of 6.	5 pairs with respectively 2, 2, 4, 2, 1 flying young, and a few adults.	2 flocks. 30 +, of which 50% were juveniles and 60 + also with a high percentage of juveniles.	c. 150
Jan. 12-13	20 – 30 scattered along shore.	12 + (the parents of two capable youngsters were still absurdly anxious).	c. 114 spread over mud flats.	c. 150
Feb. 8	c. 27.	c. 10.	9 at pools (2 family parties of 5 & 4); 30 + along creek.	c. 80
March 8	c. 45.	5.	c. 72 (4 nearly black).	c. 120
April 4-6	80–100.	c. 50.	500 + (4 nearly black).	c. 650
May 4	120 +.	100 +.	600 +.	800–1000
June 21	30 +.	c. 60.	c. 10 at breeding pools. Hundreds on the mudflats.	c. 800
Aug. 24	c. 20.	c. 12.	30–40 at breeding pools. Scores on mudflats, of which a large proportion were juveniles.	200 +
Sept. 27	4 or 5 pairs & some juveniles.	None on last year's nesting sites; 6 (including 2 juveniles) on shore.	16–20 pairs & some juveniles. 1 nest with 4 eggs & 2 with 1 egg each. No birds sitting hard. 60 + juveniles on mudflats.	c. 120
Oct. 18	4 pairs, not disturbed.	8 (4 juveniles); none apparently nesting.	c. 60 (including some juveniles) at breeding pools. Probably 20 + pairs nesting. Nests found with 5, 4, 4, 4, 2 eggs. 12 + juveniles in big creek.	c. 90

Note.—Young are not included in census till they reach the flying stage.


KAIAUA, Firth of Thames.
Population of Stilts, 1941-1942.
4 or 5 pairs bred.
110
100
90
80
70
60
50
40
30
20
10
July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept.
1941
1942


Population of Stilts.
Kaiaua-Miranda, Firth of
Thames, 1941-1942.
c. 32 pairs bred.
900
800
700
600
500
400
300
200
100
July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept.
1941
1942

A PETREL ON THE NORTH AUCKLAND MAINLAND.

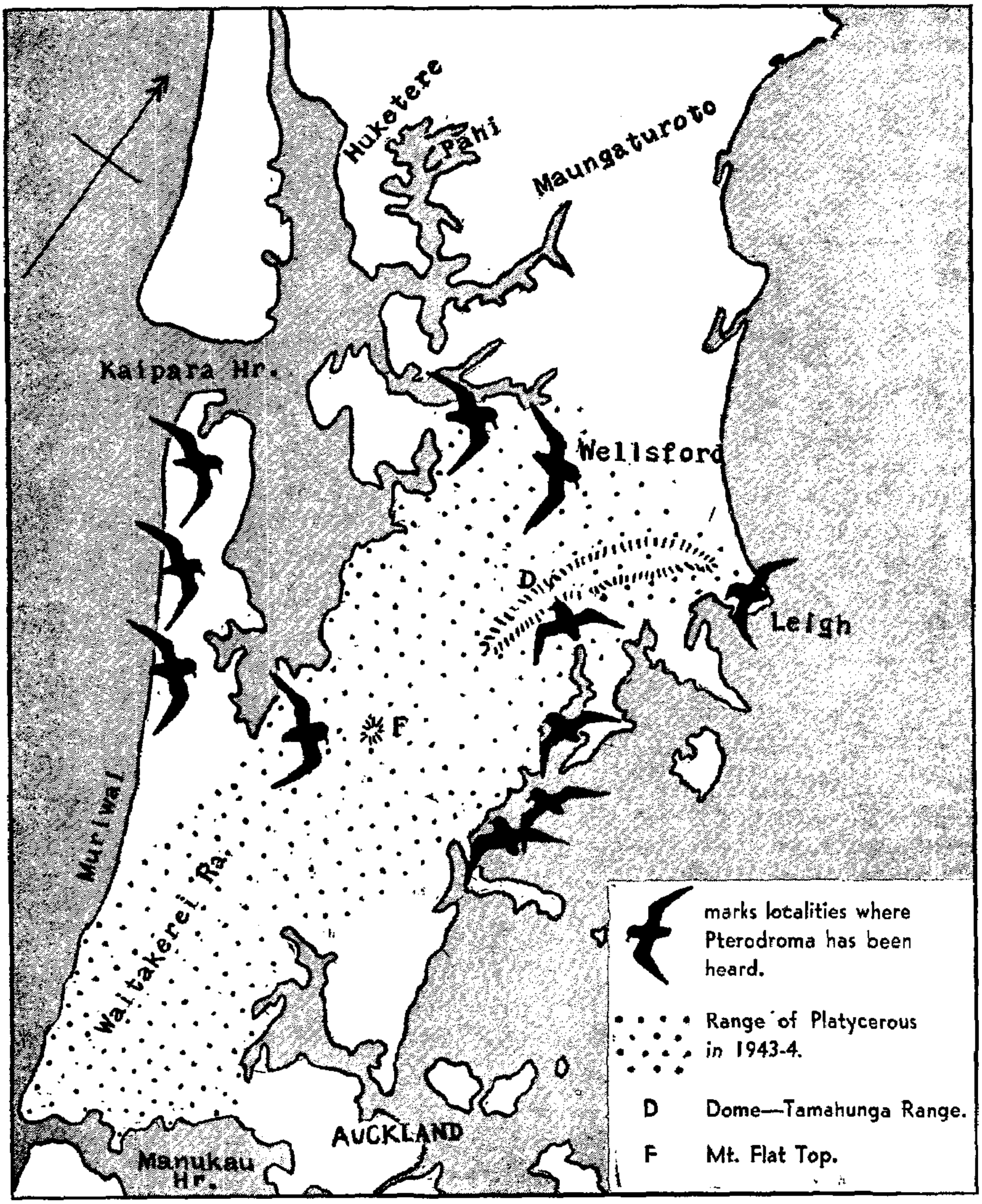
By C. A. Fleming.

In August, 1943, Dr H. Morrison, of Wellsford, told me that a petrel with a call like Cook's Petrel regularly passed over Wellsford and Warkworth on summer evenings. I heard the cry at Orewa from 14/11/43 fairly regularly until Christmas, at Kaukapakapa on 10/1/44, at Leigh on 28/1/44, and have previous records from Mahurangi Heads (23/12/35). To these records may be added cries heard at three separate places on the South Kaipara Heads Peninsula (19-21/1/44, R. B. Sibson), at Waiwera (December, 1943, S. D. Potter), and near Port Albert (several months and years, G. A. Buddle).

The calls may be syllabified as "kek-kek-kek," 4-8 "keks" being uttered nasally with machine-gun rapidity and occasionally terminating in a wild cry. They closely resemble a short, isolated burst of cicada song. They appear to be uttered at no great height, and a distinct impression is gained of swift movement in a constant direction inland. Cries commence in the hour after dusk, 8.30 in November and January, and are less frequent after 10.30. They are apparently little affected by moonlight and appeared especially clear and frequent after showery weather. At Mahurangi I glimpsed the birds in silhouette on a moonlit night.

Cookilaria cookii, C. pycrofti, and *Pterodroma inexpectata* all have similar cries, but the call of *pycrofti,* at least, is a softer and higher pitched "ti-ti-ti" than those under discussion. Observers who have heard Cook's Petrel at Little Barrier (G. A. Buddle and Dr Morrison) stress the similarity to the mainland calls and believe they are uttered by Cook's Petrels flying across the island in changing oceanic feeding grounds. Further, Major Buddle remembers hearing the calls in winter months. However, as none of us know the call of the Mottled Petrel except by repute, and as that species has a reputation for inland breeding (Canterbury, Ruahine Ra., Urewera, etc.) in former times, the possibility that it has continued to breed in some of the bushed ridges of the North cannot be dismissed. The ridge on which stand Tamahunga (1380ft) and The Dome (1037ft) and the high country adjacent to Mt. Flat Top (about 800ft) between Wainui and Makarau are possible locations for such breeding colonies. It is worth noting that similar calls heard at both Whangaparapara and Port Fitzroy, Great Barrier, in November, 1936, seemed to be softer and higher pitched than the Mahurangi ones, so that I associated the former with *cooki* and the latter with *inexpectata.* The identity of the bird must be left open until more tangible evidence is available.

I may take this opportunity to correct my identification of certain Chatham Island skulls as *inexpectata* ("*The Emu,*" Vol. XXXVIII, p. 403). The skulls are definitely not those of any *Pterodroma* known to nest in such latitudes, but of a bird about the size of the Kermadec Island *P. neglecta.*


Huketere
Pāhi
Maungaturoto
Kaipara Hr.
Wellsford
D
Leigh
F
Muriwai
Waitakere Ra.
AUCKLAND
Manukau Hr.
marks localities where Pterodroma has been heard.
Range of Platycerous in 1943-4.
D Dome—Tamahunga Range.
F Mt. Flat Top.

THE EASTERN ROSELLA *(Platycercus eximius)* IN NORTH AUCKLAND.

By C. A. FLEMING.

Oliver (1930) gives "Waitakerei Range" as the distribution in New Zealand of this parakeet, which entered the fauna as a "cage escape." At present (1944) the distribution is more extensive and reports from the periphery of the range suggest that the bird may still be advancing. For that reason this note is recorded. The bird has long been established in the Waitakerei area, from Titirangi to Muriwai. I have no reports from south of Manukau Harbour, and the closely settled Auckland isthmus has apparently prevented its spread S.E., though there have been occasional records from eastern suburbs (S.D.P.). I have no records from the North Shore Peninsula south of Dairy Flat, but from there west to Kaukapakapa the bird is common, and there appears to be continuity south to Kumeu and Henderson. Throughout the area bounded by the Kaipara to the west, I found the rosella abundant as far north as Tauhoa, Wellsford, and Warkworth between July, 1943, and January, 1944, and Mr S. D. Potter has records from Leigh on the East Coast, though local observers there do not report its presence, and it is not yet a permanent resident. It seems absent from the South Kaipara Heads peninsula (R. B. Sibson), from Okahukura Pen., from the Kaiwaka-Maungaturoto area, and from Pahi and Huketere Peninsulas (C.A.F.), and was absent, at least until a few years ago, from east coast localities north of Leigh. At Silverdale and Tahekeroa, both now well within the range, residents report that the bird was rare or absent four to six years ago.

The range includes native bush, *Pinus* plantations, farming and orchard land with frequent relics of bush or planted shelter belts, and gumlands, usually with some pines. The birds occur in conspicuous and noisy flocklets or in pairs, so that any further spread in range should not be hard to record, even on rapid journeys through the country.

THE RED-BILLED GULL IN DUNEDIN.

By JOCELYN BARNETT and JOSEPHINE PILKINGTON,
Caversham School, Standard IV.

Having noticed that a varying number of gulls visited our school grounds during the previous year, we became interested in their habits, and in 1943 decided to tabulate their attendance. Our classroom is on the top floor of a two-storeyed building and the windows overlook a flat, grassy playground of about $2\frac{1}{4}$ acres. In wet weather this area is too soft and soggy for children to play on, and it was usually under these conditions that we saw the most gulls.

First of all, we drew up a chart which was divided into four columns. The first was reserved for the date, the second for the number of gulls, the third for a weather record on the previous night, and the fourth for comments. The project commenced on March 31,

and the gulls were counted at 9.30 a.m. each school day. Owing to the infantile paralysis we had to miss a period between April 21 and May 5.

Till April 21 the ground was very hard and dry, and there was very little rain. The number of birds at this time ranged from 0 to 11 daily, with an average of 3-5.

In the winter term when the soil became soft the gulls were very numerous and were noticeably more common when we returned to school on May 17. By the second week, which was wet, a total of 147 was counted for the five days. The third week was frosty and fine, resulting in only 65 being present; this was the procedure throughout the whole term. Heavy rain the night before caused birds to arrive, and they remained as long as the ground stayed soft. During frost the numbers were greatly reduced.

The greatest daily number was 76 on July 26, after a very wet week-end. The very frosty three days from August 9 to 11 did not produce a single bird.

On foggy mornings there were very few till the fog lifted. For example, on July 13, when the playing area was enveloped in misty rain, there were 12 birds at 9.30 a.m. and 41 at 11 o'clock, by which time it had cleared.

The birds displayed a tendency to face the wind when feeding. They usually landed near that part of the ground farthest from the wind and walked towards the opposite end.

The third term began on September 7, and for the whole of that session not one gull landed on the grass. This occurred even though it was very wet in September and most of October, causing the ground to become quite soft.

In the sub-joined table is given the results of the daily observations grouped into school weeks:—

Date.	No. of Days.	No. of Gulls.	Average.
March 30 to April 2	4	12	3.0
April 5 to April 9	5	23	4.6
April 12 to April 16	5	20	4.0
April 19 to April 21	3	5	1.7
End of 1st Term.			
May 17 to May 21	5	51	10.2
May 24 to May 28	5	147	29.4
May 31 to June 4	5	65	13.0
June 8 to June 11	3	92	30.7
June 14 to June 18	5	70	14.0
June 21 to June 25	5	160	32.0
June 28 to July 2	5	91	18.2
July 6 to July 7	2	15	7.5
July 12 to July 16	5	98	19.6
July 19 to July 23	5	114	22.8
July 26 to July 29	4	146	38.7
August 2 to August 6	5	63	12.2
August 9 to August 11	3	0	0.0
August 16 to August 20	5	40	8.0
End 2nd Term.			
September 7 to December 16	73	0	0

NOTES ON THE SONGS OF CERTAIN BIRDS IN DUNEDIN.

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The Town Belt, in Dunedin, is a belt of scrub inhabited by Bellbirds (*Anthornis melanura*), Greywarblers (*Pseudogerygone igata*) and Fantails (*Rhipidura flabellifera*). It was decided to record their songs as heard from a house adjacent to this area, none heard elsewhere being included. A card ruled with squares for each bird and each day was hung, together with a pencil, in a convenient place, and a cross made in the appropriate square to show the days on which each song was heard. No attempt was made to indicate intensity of song. This method is very easily carried out over long periods without interfering in any way with one's normal life and the habit of hearing and remembering a song is soon acquired. The records discussed here cover more than five years. The diagram shows part of the records, from 1941-1944, and the height of the black columns indicates the number of days per week on which the song was heard. Interruptions in the base line show weeks in which records were not taken.

The song of the Grey Warbler, being long and rambling, cannot be satisfactorily noted down, but it appears to be always more or less the same in Dunedin, though somewhat different elsewhere. It was to be heard at all times of the year, though there was a marked diminution in the winter months, when there were usually a few weeks when it was not recorded. The main peak of singing activity comes in September or October, and it falls to a low level in December, reaching another peak in February or March. According to Oliver, there are two broods, in September and October or November.

The song of the Fantail showed a marked seasonal periodicity at the point of observation. About March or April it was usually heard almost every day, but from August to December few if any songs were noted. This periodicity might be due to seasonal movements of the birds away from the area, and this is made more likely by the exceptional results in 1942, when there was a spring as well as an autumn peak of song activity. Possibly there was a nest in the vicinity that season. Seasonal song observations at different points in the same district might give information about the movements of a bird such as this.

The Bellbird is especially interesting, as it has much more varied songs than the other two, and the songs are often easy to recognise, as they consist of only a few distinct notes. It soon became clear that in Dunedin there were three different and easily recognisable songs, which for convenience were called Nos. 1, 2 and 3. Some others were also noted, and will be mentioned below. No. 1, a distinct phrase of seven notes, seems to be the ordinary call note and is heard at all times of the year. There is, however, as will be seen from the chart, a seasonal periodicity of song activity. This is very well shown in 1943, when there was a peak in May and a period of minimum song in October, but is also apparent in the other years. 1941 seems to have been a late year, with the peak about August. Song No. 2 when sung

in full, seemed to consist of two notes, followed by a sound best written as " zizz," followed by the two notes again. Then came a phrase of six notes, the third being a high one heavily accented. At times groups of male Bellbirds were noted sitting a few feet apart, all singing this song with great energy. The periodicity of this song is similar to that of No. 1, with the peak of activity in June or July, but during four or five spring and summer months it was not heard at all. It should be repeated that all these records were purposely restricted to one point only. At the end of October, 1943, in an area of bush about two miles away, Bellbirds were heard singing No. 2, a date on which it was never heard at the point of observation. Song No. 3 consisted of a series of descending notes, usually four but sometimes three or five, in which case the last note was slurred and accented. The chart shows clearly that the seasonal occurrence of No. 3 is almost identical with that of No. 2. No special efforts were made to observe the behaviour of the birds, but nothing comparable with the group singing of No. 2 was noticed in connection with No. 3.

In May, 1941, another song, No. 5, was first recorded. It was less well marked than the others and had possibly been overlooked earlier as it has been recorded ever since. It is not shown on the chart, but its incidence resembles those of Nos. 2 and 3, being absent during the last four months of the year. Its peak, however, falls somewhat earlier than those of the other two. Four other songs were noted, very well marked and easy to recognise, but only heard for short periods. One was heard for five days in August, 1938; one for one day in August, 1941; one for three days in August, 1942; and one for one day in March, 1944. These unusual songs might be due to strange birds passing through the area.

One interesting thing became apparent as soon as the habit of hearing and recording songs had been acquired, and that was their difference in different localities. No systematic attempt to study this has so far been made. At Taieri Mouth, some 20 miles south of Dunedin, the usual song, apparently corresponding to No. 1, is not the same as in Dunedin, and another is very reminiscent of No. 2 but differs from it in detail. Even in bush areas only a mile or two away, unfamiliar songs or variants of familiar ones have been noted, and the matter seems worthy of further attention.

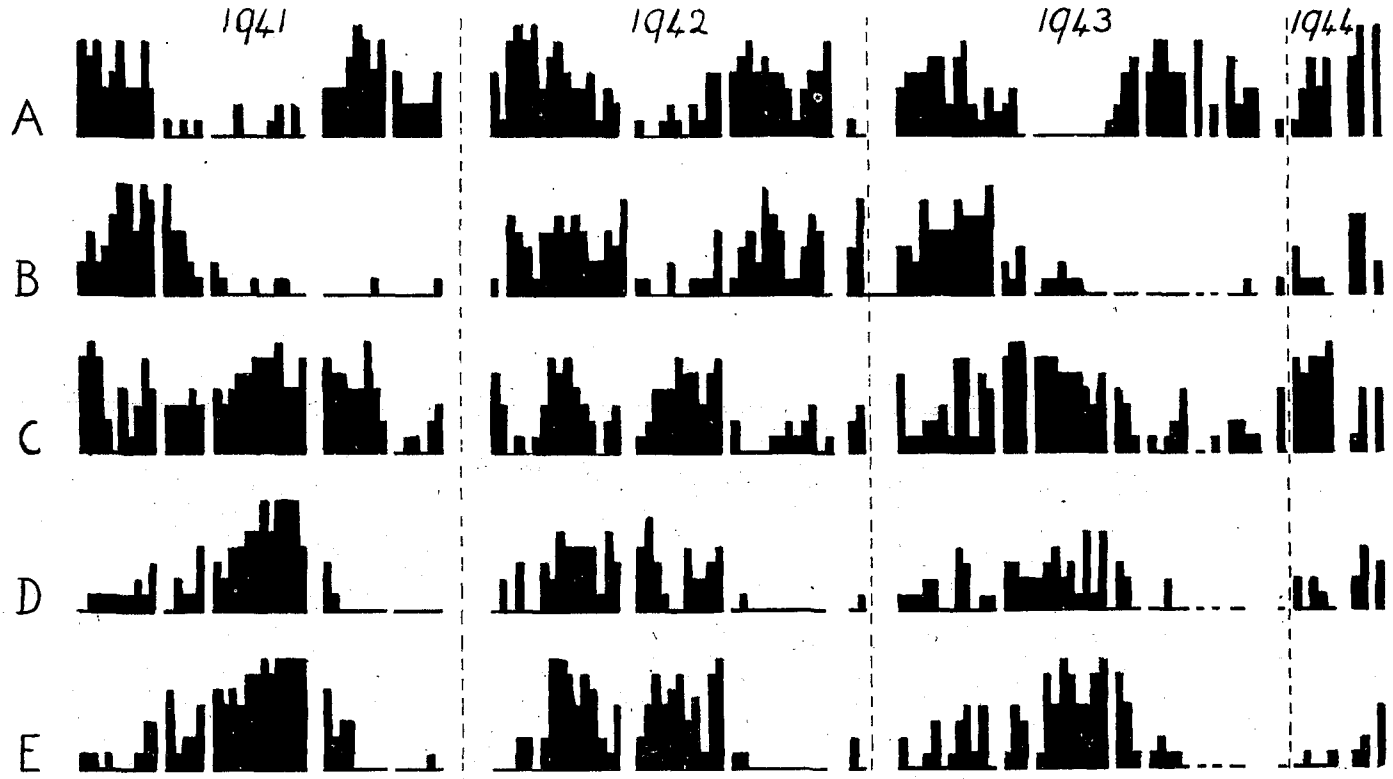

Chart Showing the Number of Days per Week on which the Various Songs were Heard.

A—Grey Warbler. B—Fantail. C—Bellbird, Song No. 1. D—Bellbird, Song No. 2. E—Bellbird, Song No. 3.