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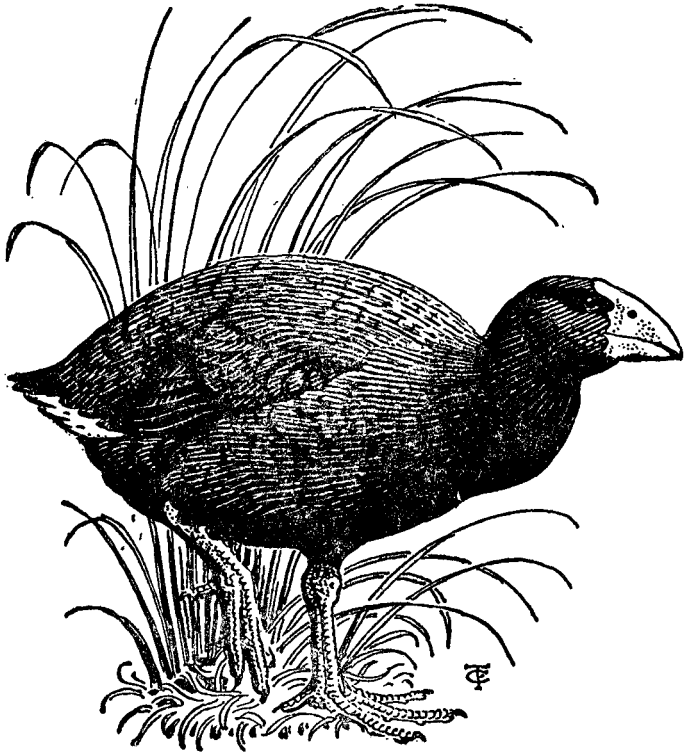
Journal of the Ornithological Society of New Zealand



Volume 21 Part 2 June 1974

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[Registered with POHQ, Wellington, as a magazine]

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NOTORNIS
is the journal of the Ornithological Society of New Zealand (Inc.)
Editor: E. W. Dawson,
P.O. Box 8009,
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VOLUME 21 PART 2 JUNE, 1974

# LOCAL DISTRIBUTION AND FEEDING HABITS OF BULLER'S SHEARWATER (Puffinus bulleri)

By J. A. F. JENKINS

ABSTRACT

Observations from 15 years of voyages in coastal New Zealand waters are analysed. There is evidence for a continuing increase in numbers of Buller's Shearwater. The population pressure in northern waters is thought to be such that the extra birds are forced southwards to feed. The suggestion that the southern birds are non-breeders may be true but it is pointed out that as the total population increases so do the numbers of breeding birds which then have to forage further afield. Distribution maps showing seasonal movements and numbers including areas to the east and west of New Zealand are given. The three main feeding methods observed are described.

## INTRODUCTION

The following notes on distribution and feeding habits have been collected over the last fifteen years on voyages in the coastal waters of New Zealand. Since all these passages (Fig. 1) were in merchant vessels on commercial voyages, areas away from the trade routes were not visited at all, whilst other areas, i.e. Auckland - Bluff and Auckland - Cape Reinga were crossed many dozens of times. The region to the east of N.Z. clear of coastal waters was not visited though the Tasman Sea approaches were reasonably well covered. No attempt has been made to plot the area between Greymouth and Puysegur Point owing to lack of records. It is realised that this coverage is very far from the ideal, but since most recording now and in the future must be made from merchant vessels, it is at least a start, and could provide a possible basis to show any changing patterns of distribution over the years.

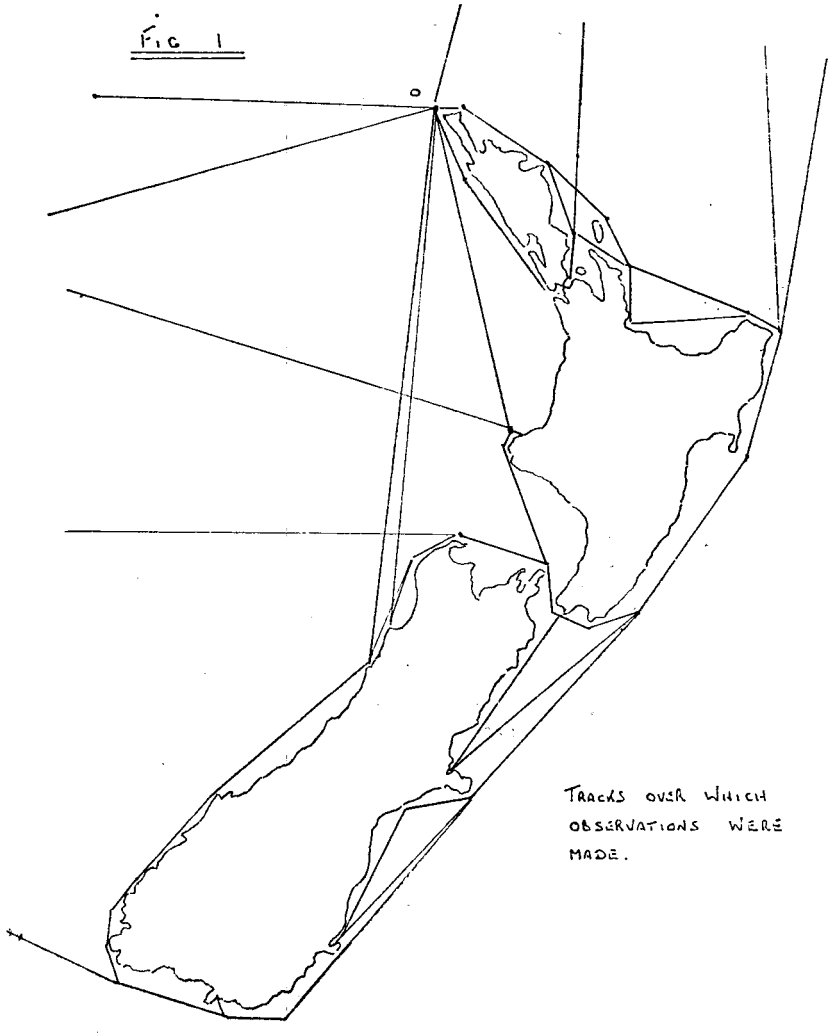


FIGURE 1 — Ship's tracks over which observations were made.

The most obvious change in distribution over the study period may have been caused by the evident increase of Buller's Shearwaters which are seen in our coastal waters. I commented on this up to 1969 (Jenkins 1969) and I am sure that this increase is continuing at the present time. There can be no other explanation for the increasing numbers of birds seen about the South Island without any decrease taking place about the North Island. In my opinion, the

northern waters have all the Buller's Shearwaters they can support and the extra birds are being forced southwards to feed. It has been suggested (Cunningham 1948: 190) that these southerly birds are the non-breeders without the need to return regularly to the only known breeding colony at Poor Knights. This could well be true but, as the size of the total population increases, so does the number of breeding individuals and there comes a time when even the breeding birds have to forage further afield. Bartle (1968: 80) stated that the Buller's burrows on Aorangi Island have increased from practically nil in 1925 when wild pigs were present, to about 100,000 in 1964, twenty-eight years after the pigs were exterminated. It would be interesting to know if this increase has continued and, if it has as sea observations seem to indicate, whether the extra consumption of available food has affected the numbers of other petrels breeding about northern New Zealand ?

## DISTRIBUTION

Figure 2 shows the average number of birds to be seen on crossing a particular area during the summer months December to February, but it is in no way an indication of the total number of birds about the coast.

It can be seen from the map that these birds tend to concentrate off capes and peninsulas. This, I believe, is to enable them to have reaonably calm water over which to feed. The best example of this is around the North Cape area where during strong west or south-west weather virtually all the birds will be found on the eastern side of the Cape and in easterly weather down the western side. The wind force and consequent sea state will, therefore, vary the distribution pattern considerably, but it is a consistent variation and it is predictable.

As is to be expected, most birds are found in the coastal waters from Whangarei around North Cape and down the west coast (see Fig. 4). Over the years of these observations it has become obvious that there is a definite pattern to this feeding movement. The birds are always in the highest numbers between Poor Knights and Cape Reinga during the early part of the day, i.e. between dawn and about 0800 hrs. At this time they are spread out over the sea surface in the typical shearwater feeding pattern and are seen to be drifting northwards along the coast towards the Cape. During this early period many thousands of birds are in sight at all times; however after about eight or nine a.m. the numbers decrease rapidly and during the afternoon most birds seen are in rafts on the surface. The rafts can contain several hundred birds but are more usually about fifty individuals. Whilst these rafts contain great numbers of birds, it is known that many more have passed around North Cape and Cape Reinga. Therefore, providing the weather on the west coast is reasonable, it can be concluded that these birds extend down the west coast probably towards the convergence zone off the Kaipara Coast.

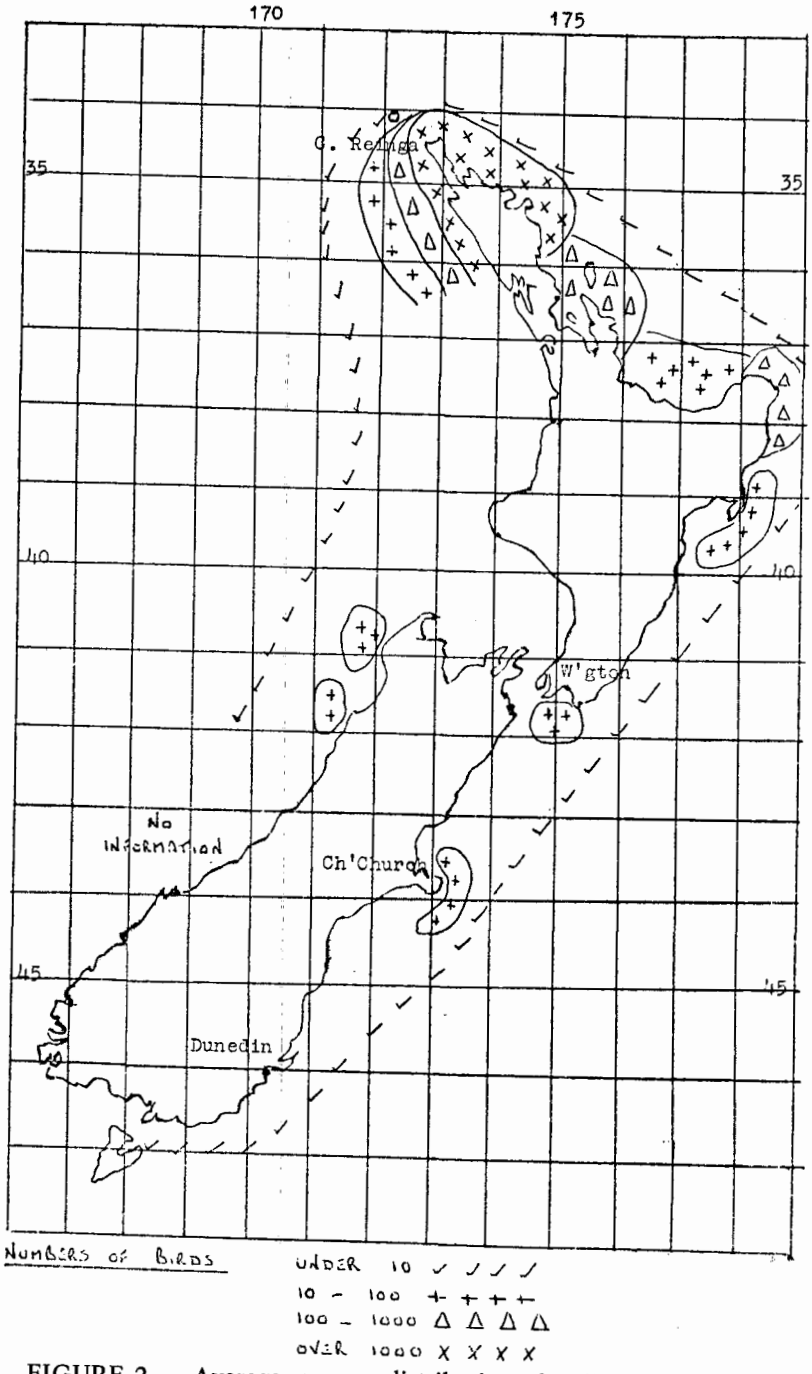


FIGURE 2 — Average summer distribution of Buller's Shearwater.

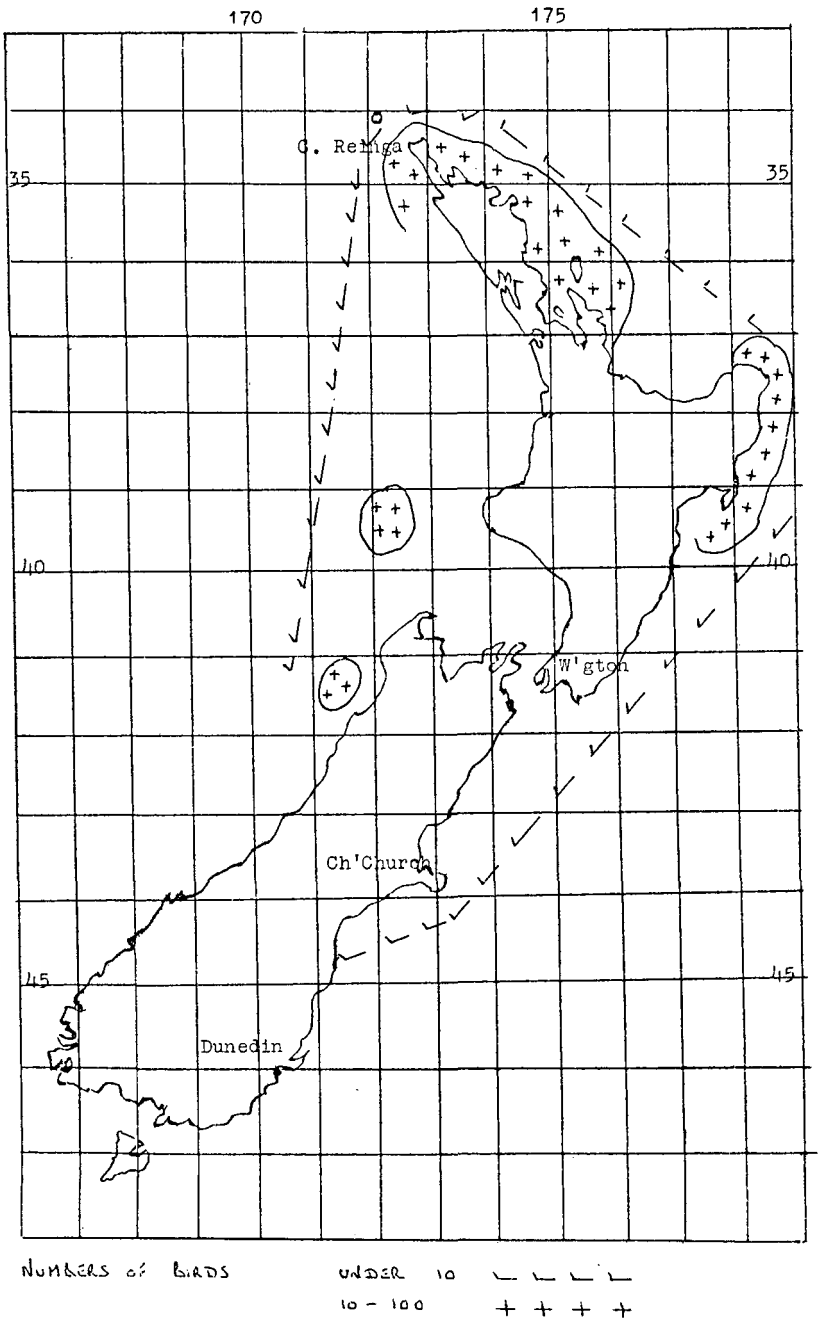


FIGURE 2A — Average May distribution of Buller's Shearwater.

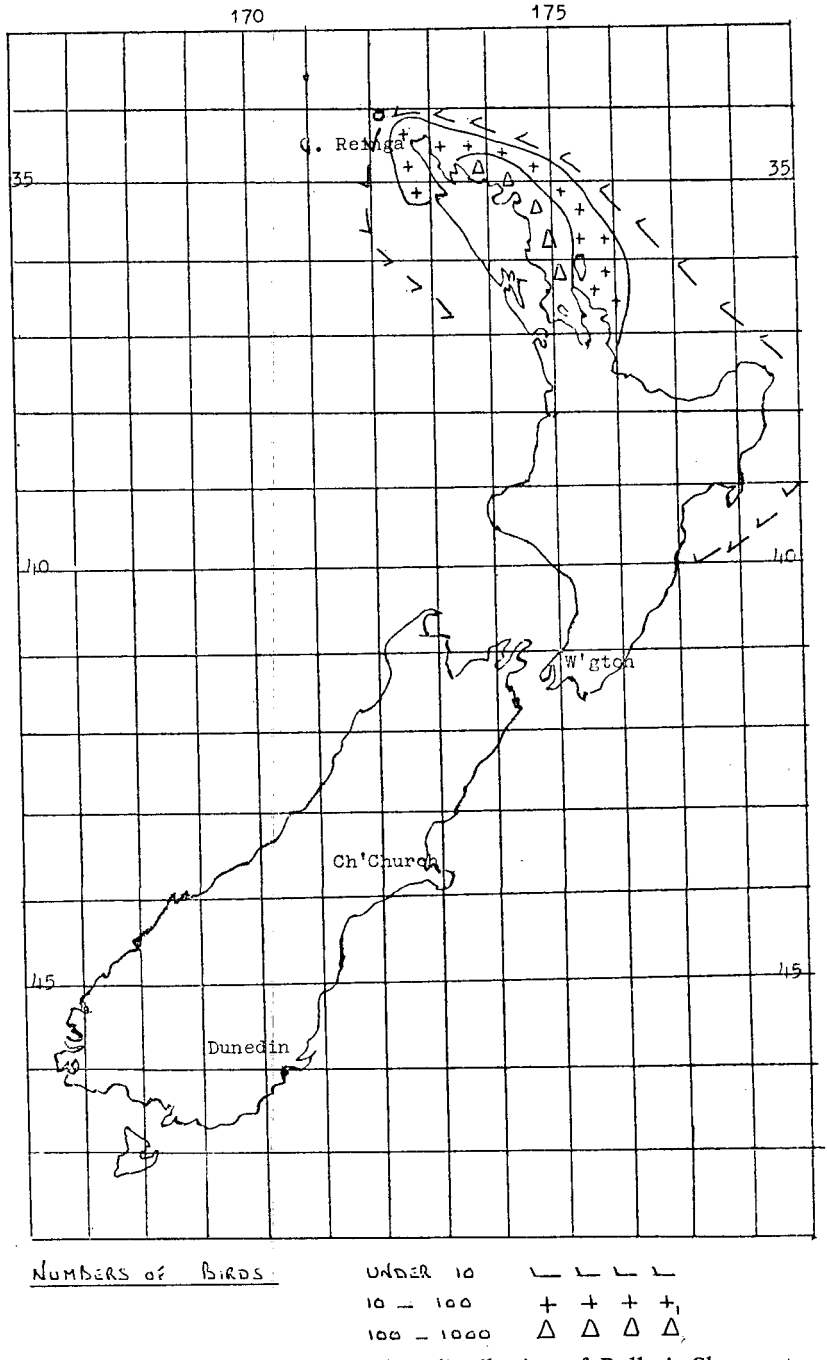


FIGURE 2B — Average September distribution of Buller's Shearwater.

A most noticeable thing is that this morning flight around the north of the island is definitely not followed by a return flight during the afternoon and evening. It is doubtful if the return occurs after dark as this would make it very late in the night before the birds could visit their burrows on the Poor Knights. From this it appears to me that there could well be many birds that over-fly the North Island and return direct to the Poor Knights from the west coast. This habit has been noted for Cook's Petrel *P. cooki* and recorded by Fleming (1950: 184-185). Cook's Petrels were noted by their calls, but since Buller's Shearwater is reportedly a rather quiet bird over the land on the breeding islands (Kinsky & Sibson 1959: 135), this silence could mean it has escaped notice over the mainland.

Fig. 2A shows the distribution in May when probably the bulk of the population has already left on the annual migration as the numbers to be expected in any area are very much reduced (Falla 1934: 251). There are still birds about the West Coast of the South Island and about the East Cape area which tends to disagree with the theory that the birds in these areas in summer are non-breeding, for surely these non-breeders would tend to be the first to leave on migration. Conversely, it could be argued that the non-breeders leave our waters after the main migration of the breeding population. From Fig. 2B, the average September distribution, it can be seen that the birds which return first tend to occupy northern waters and the spread southwards does not seem to start until well into October. A few stragglers excepted, the whole population is in New Zealand waters by the end of November.

During the summer months Buller's Shearwaters do not as a rule concentrate outside the 100 fathom line. They are a comparatively rare bird 60-80 miles to the west of Cape Reinga, and outside the migration times the number drops off much more quickly to the north. Here one is very lucky indeed to see Buller's Shearwaters more than 40 miles north of North Cape.

Fig. 3 shows my records, and those from Norris 1965 and Simon 1967 (*in* Bourne & Dixon 1973:42), amounting to a mere twenty birds over a long period of Tasman crossings, and indicates how little these birds move into the Tasman. It is noticeable that all my records are for the Cape Reinga to Melbourne route, no sightings having been made on the Wellington or Bluff to Melbourne routes. Norris (1965: 91-92) was fortunate enough, however, to sight Buller's Shearwaters well south of my sightings whilst on passage, Bluff to Sydney.

To the east of New Zealand the picture appears to be different. Fleming (1950: 184-185) reported numbers of these birds seen up to 800 miles eastward of the North Island in October, and suggests that these birds could be returning migrants. However, birds seen as far as 168°W in December could well be foraging from the Poor Knights

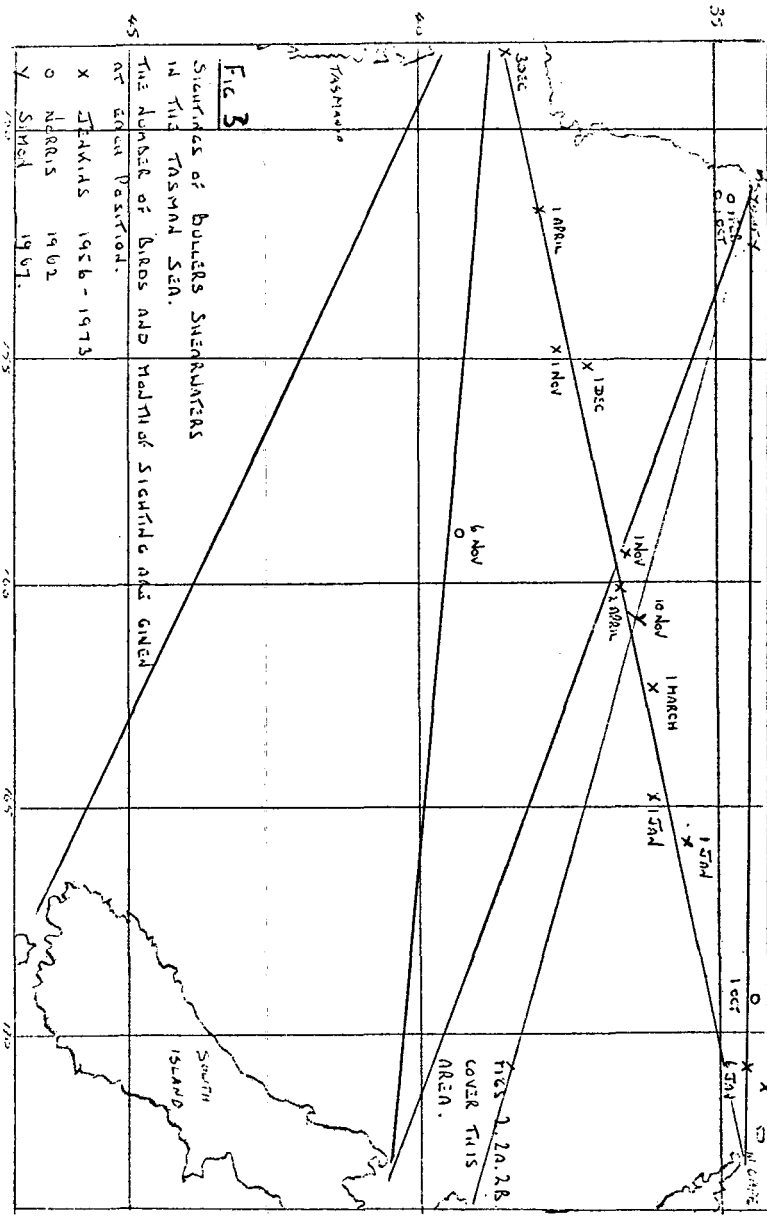


FIGURE 3 — Sightings of Buller's Shearwaters in the Tasman Sea.

and indicate a much greater spread to the eastwards than has been found into the Tasman.

I have only once been fortunate enough to see the migration of these Shearwaters. That was on 11 September 1967 in a position 32°40'S 175°35'E about 160 miles north of the Poor Knights, when for over two hours from 1630 hrs until after sunset we passed through a continuous stream of Buller's Shearwaters spread out in the typical migration pattern in ones and twos and groups up to about five. Birds were seen out to the limit of visibility on both sides of the vessel's track and all were seen to be heading due south. At least several thousand birds must have passed the vessel during the late afternoon.

## WINTER RECORDS

| | | |
|---|---|---|
| JUNE | 26/6/62 | 1 bird at North Cape |
| | 1/6/63 | 2 birds at 33°28'S 175°25'E |
| | 2/6/69 | 4 birds between Poor Knights and mainland |
| | To be added to the above is Peakall's observation of 1 bird at 31°S 175'E on 2/6/59 (Bourne 1960: 14) | |
| JULY | | NIL |
| AUGUST | | NIL |

## FEEDING

From field observations three main methods have been noted.

*(a)* The spread northward from the breeding islands during the early morning where each bird flies low over the sea surface, keeping a careful watch for anything edible and landing immediately on sighting something. Since at this time many thousands of birds are quartering the area, it is doubtful if any but the first few waves of birds obtain much food by this method to the south of North Cape, that is in the east coast feeding area. These early birds are probably the ones that form the rafts seen during the late morning and afternoon between North Cape and Cape Brett. The main area of concentration of these rafts is some 10-20 miles south eastward of North Cape; the remaining birds tend to drift around the north of the land and feed down the west coast. In my opinion, the majority of these birds probably feed in the area of convergence off the Auckland west coast where the West Auckland current meets the Westland current (see Fig. 4). An observation by Neil Cheshire (pers. comm.) seems to support this theory as on 3 November 1973 whilst 4 miles off the Hokianga Harbour he saw c. 1300 Buller's Shearwaters in rafts of up to 100 birds, and also in conjunction with shoals of fish.

*(b)* During the summer months especially, very many shoals of fish are seen in our coastal waters. In all probability these shoals consist largely of Trevally and Kahawai, and when these fish are being preyed upon by larger fish, patches of the sea boil up with white water and fish. These shoals always have a large attendance

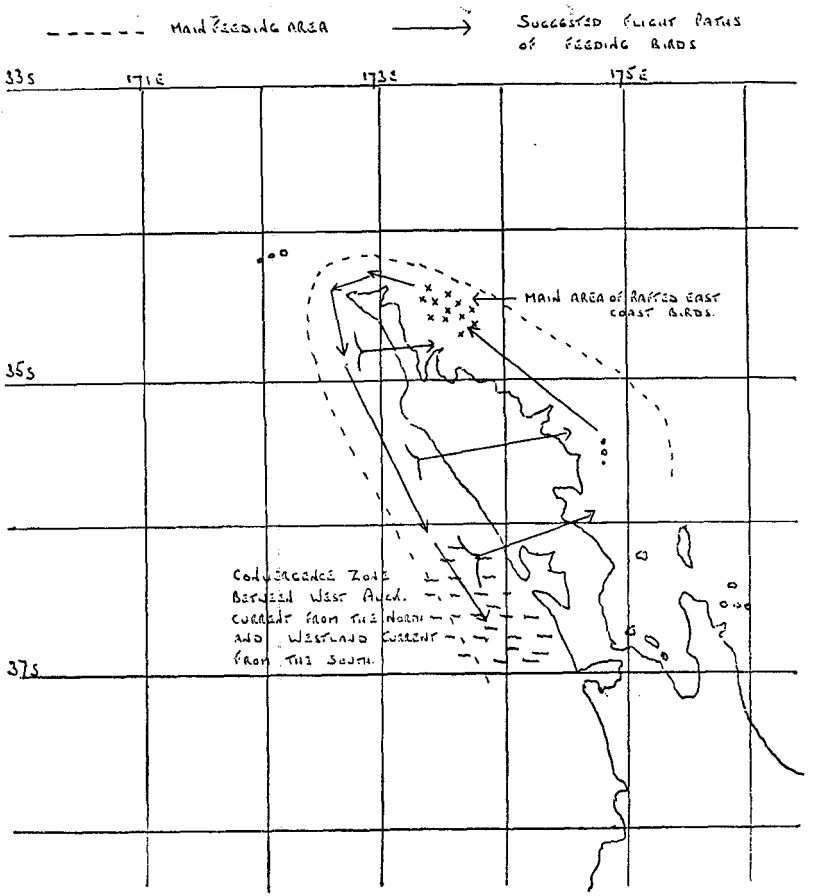


FIGURE 4 — Main feeding areas of Buller's Shearwater.

of birds. Close to the land Red-billed Gulls are in the majority, but further seaward the number of gulls is reduced and the true seabirds take over. In the main, Buller's Shearwaters, like the other shearwaters, do not fly over these areas of boiling water. In fact, the only birds that regularly get right into the shoals seem to be the Gannets. The shearwaters tend to collect on the edges of the shoals and about North Cape where there are strong tidal streams on the down current side of the shoals. From this it would appear that the birds are collecting the remains of the banquet which is being enjoyed by the bigger predatory fish. A specific observation of this type is shown in Figure 5. On this occasion the attendant birds were 10 Flesh-footed Shearwaters, 140 Buller's Shearwaters, 40 Sooty Shearwaters, and 30 White-faced Storm-petrels. Sitting close to the disturbed water were

2 Shy Albatross which appeared to be of the typical race *(Diomedea cauta cauta)*. On this occasion the only bird seen actually amongst the fish was a Sooty Shearwater. The other petrels were seen to be collecting or fighting over bits of food on the surface.

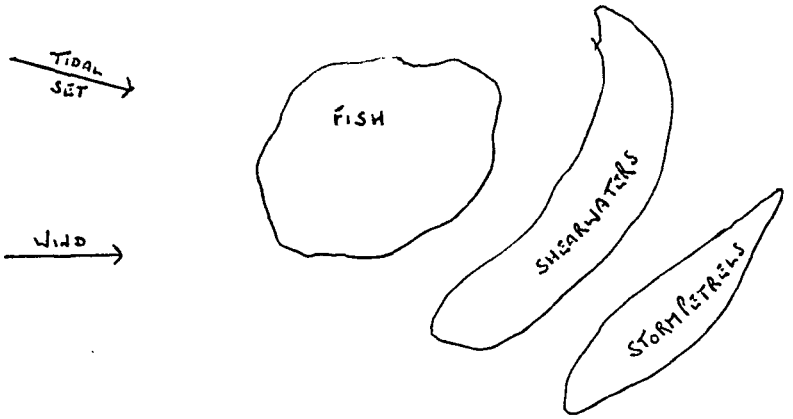


FIGURE 5 — Distribution of birds about fish shoals.

It is interesting to note the very close association between Buller's Shearwaters and Flesh-footed Shearwaters in our northern coastal waters. It is unusual to see a raft of Buller's that does not have a few Flesh-footed sitting around the outside of the raft and equally unusual to see a raft of pure Flesh-footed in coastal waters.

*(c)* On very calm water Buller's Shearwaters have been seen feeding in the manner of surface feeding ducks, that is with their heads just under the surface and swinging from side to side whilst they were swimming forward. On these occasions, when the weather has been flat calm and I have passed very close to the feeding birds, there has been nothing visible in the water, so it is probable that the food is some form of plankton. The way that Buller's float when at ease, well down in the water, and the comparatively long neck, must aid this type of feeding. On several occasions the birds have been seen to up end in the water, leaving only the rump clear above the surface. I have never seen a Buller's Shearwater dive under the surface though Roberts (1951: 40) reported seeing several diving down to about 20 feet after bait.

## ACKNOWLEDGEMENTS

I should like to thank Mr R. B. Sibson for his help and stimulating criticism in this project, and for his continuing assistance both to myself and to other seafarers who have an interest in pelagic birds. The help of Mrs Cherrie James who typed and retyped the manuscript is gratefully acknowledged.

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# BULLER'S NEW ZEALAND SPECIMEN OF GREY HERON

By KENNETH C. PARKES

ABSTRACT

The Grey Heron *(Ardea cinerea)* was placed on the Suspense List of the 1970 OSNZ Checklist, as the Checklist Committee could not confirm the existence of an 1898 specimen reported by Buller. Buller's "third collection," including this heron, is in Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, U.S.A. The Grey Heron should be readmitted to the main New Zealand list, but under the name *A. c. jouyi* Clark rather than *A. c. rectirostris* Gould.

The Asiatic Grey Heron was listed in the 1953 Checklist (OSNZ 1953: 31), under the name *Ardea cinerea rectirostris* Gould, on the basis of one specimen record and two sight records. In the 1970 Checklist (OSNZ 1970: [75]) the species was removed to the Suspense List. Criteria for inclusion in this list were "(a) old records, some of which are unique, and no longer verifiable either because no specimens were obtained, or because specimens said to have been obtained are no longer traceable; (b) recent records of rare vagrants which are unsupported by adequate evidence . . ." (OSNZ 1970: 9). Mr F. C. Kinsky, Convener of the Checklist Committee of the OSNZ, confirmed (letter of 18 October 1973) my suspicion that the specimen of Grey Heron mentioned in the 1953 Checklist belonged to category (a) and the sight records to category (b).

The specimen record cited was that of Buller (1905, I: [193]), who stated: "We have now to include New Zealand in the range of this noble bird, Mr A. Waley having obtained in Auckland the skin of one which was caught on board a schooner off the east coast, the authenticity of its capture being beyond all doubt. It was carefully stuffed by Mr Spencer, of Queen Street, Auckland; and, on Mr Whaley's collection becoming dispersed in London, it came into my possession [discrepancy in spelling the collector's name as in Buller]." The members of the Checklist Committee, being unaware that this specimen still existed, considered it to fall under the "no longer traceable" criterion of category (a) of the Suspense List.

New Zealand ornithologists seem generally to have overlooked Buller's account of the disposition of his collections, as it appears on the last text page (167) of his Supplement (Buller 1905, II) under his account of *Glaucopis wilsoni* [now *Callaeas cinerea wilsoni*]. Why there ? Buller was in a reminiscent mood as he completed his Supplement. The first birds he ever collected, at the age of twelve, were

four "*Glaucopis wilsoni,*" which "a devoted mother, who had never skinned a bird before, succeeded, with infinite trouble, in converting . . . into four beautiful cabinet specimens." At the end of the species account, Buller mentions that these four specimens were ". . . the foundation of a collection which in after years assumed important proportions, and was, on the publication of my first edition, in 1872-3, presented by me to the Colony, when it straightway became the 'Type Collection' in the Colonial Museum. . . My second collection was sold by me, on the publication of my second edition, in 1888, to the Hon. Walter Rothschild, for the Tring Museum [as is well known, the Rothschild Collection is now at the American Museum of Natural History, New York] . . . and my third collection, on the completion of this 'Supplement,' to the Carnegie Museum, Pittsburgh, U.S.A. . . ."

The New Zealand specimen of *Ardea cinerea* belonged to this "third collection," and is still at the Carnegie Museum of Natural History, where it bears catalogue no. 24467. The only data on the label are "Australian straggler: shot off N.Z. coast. 1898." There can be no doubt that this is the specimen about which Buller wrote. The skin is in reasonably good condition, but is badly stained. From the nature and position of the staining, I suspect its origin to be the substance with which the skin was poisoned against insect pests. Many Nineteenth Century taxidermists had secret formulas for poisoning and preserving skins, formulas they guarded as Twentieth Century cosmeticians guard theirs. Unfortunately, some of the ingredients of these mixtures ultimately had detrimental effects on the specimens, including the blackish staining typified by the Grey Heron skin.

Buller's specimen is a first-year bird, with no sex indicated. The name *rectirostris* Gould, used in the 1953 Checklist, is now generally considered to be a synonym of *cinerea* Linnaeus, as Grey Herons from India (the restricted type locality of *rectirostris*) are barely different from those of Europe (see Mees 1971, for details and references). The name *jouyi* Clark (type locality Korea) is therefore used for Grey Herons of the eastern Orient. In spite of its stained condition, the New Zealand specimen shows the pale dorsal colour of eastern birds when compared with European *cinerea* of the same age class. Mees has described as *altirostris* the apparently resident Grey Herons of Java and Sumatra, separating them from *jouyi* on the basis of deeper and (usually) longer bills. His series of *jouyi* was quite inadequate; even the two breeding males I have measured suffice to show that overlap in bill size is far greater than indicated by Mees. Whether or not *altirostris* is valid, however, the New Zealand specimen (assuming that the bills of year-old birds are full-sized) falls well below the bill measurements of Java and Sumatra birds and may safely be identified as *A. c. jouyi.*

On the basis of Buller's specimen, the Grey Heron can be readmitted to the New Zealand list under the name *Ardea cinerea jouyi.* I note that (unlike the present custom in North America) English

names are given to subspecies in the New Zealand Checklist. I suggest that *A. c. jouyi* be called " Oriental Grey Heron " rather than " Asiatic Grey Heron," as the boundary between western and eastern races shifts well to the east when *rectirostris* of India is considered inseparable from *cinerea*.

Following a suggestion by Mr Kinsky, I hope to prepare for publication a full list of the Buller specimens at the Carnegie Museum of Natural History, to make this information available to New Zealand ornithologists. The collection includes a number of rare or extinct forms; some of these specimens were overlooked by Greenway (1958).

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# SIGHT RECORDS OF GREY HERON (Ardea cinerea) IN NEW ZEALAND: AN ELUCIDATION

By ELLIOT W. DAWSON

ABSTRACT

Sight records of the Grey Heron allegedly seen in New Zealand in 1947 and 1951 and recorded in the Classified Notes of the OSNZ are shown to be attributable to a youthful confusion with the White-faced Heron *(Ardea novaehollandiae)* then less common than now. The background of this cautionary tale is given, resulting in the specimen of the Grey Heron in the Carnegie Museum of Natural History documented by Parkes (1974) representing the only genuine evidence of the occurrence of this species within the New Zealand Region.

Following W. R. B. Oliver's opinions expressed in his review of the first OSNZ checklist, some comments are made on the advisability of any checklist committee supporting its decisions on taxonomic or distributional changes by more detailed publications of its reasons. It is not considered sufficient to merge taxa or discard dubious records without documentation.

The currently appearing paper by Parkes (*Notornis,* this issue) gives a most welcome investigation of the status of the Grey Heron *(Ardea cinerea)* in New Zealand, especially to me since I am responsible for the perpetration of the error of two sight records of this species which have found their way into and, hopefully, out of the literature of New Zealand birds. For many years I have had my explanation lying in my bottom drawer but, for a variety of reasons, the time has only now come when I am able to expiate myself.

Towards the end of 1947, Dr Robert Cushman Murphy arrived in New Zealand to prepare for an expedition to the Snares Islands to obtain material for displays at the American Museum of Natural History. Amongst the places he wished to visit in New Zealand was the famous Pyramid Valley moa swamp in North Canterbury, some 50 miles north of Christchurch and arrangements were made to take him there following his return from the Snares early in December. As a schoolboy protege of Dr R. A. Falla, then Director of the Canterbury Museum, I was particularly privileged to be included in the party, led by Dr Falla, which took Dr & Mrs Murphy to Pyramid Valley on 23 December 1947. Other members of this party included Professor R. S. Allen and Professor E. Percival who were to be my teachers at university and from whom I learned that accurate observation and adequate documentation were paramount in all things.

On the journey north we stopped at several places to show off the local birds and features of interest and one such stop was at the

main road bridge over the Ashley River. Here, some distance upstream, we saw a greyish-plumaged heron, which I now assume to have been a White-faced Heron, which took Dr Murphy's attention with the remark — " That's what I would call a Grey Heron if this was Europe." With youthful enthusiasm and perhaps not appreciating the full significance of Dr Murphy's comment in relation to the relative rarity at that time of the White-faced Heron, I duly recorded it in my notes of the day as a Grey Heron. I was not then a member of the Ornithological Society but when, on joining in 1948, I sent in my first bundle of contributions for the " Classified Summarised Notes " I included this observation as — " GREY HERON *(Ardea cinerea)*.— One seen from Ashley River Bridge, 23/12/47; first seen and identified by Dr. R. C. Murphy. (E.W.D.)." and the compiler of the Notes remarked: " Notable records include those of grey heron in the South Island . . ." Who would doubt an identification attributed to a world authority ? Not having been brought to task, I recorded in the 1951 issue of the Notes — " GREY HERON *(Ardea cinerea)*. — Bird seen, Ashley River Bridge, closely resembling that seen on 23/12/47 (N.Z.B.N., Jan., 1949, p. 91); 29/10/49. — (E.W.D.)." Both of these records were accepted, without question, as sight records in the first edition of the *Checklist of New Zealand Birds* issued by the Ornithological Society of New Zealand (OSNZ 1953).

In the intervening years no question was raised as to the correctness of these identifications, especially considering the possibility that there had been confusion with the White-faced Heron which was quickly becoming a widely distributed and better known species. Perhaps I had sealed their authenticity with my unwarranted attribution to Dr Murphy. However, in the next edition of the checklist, the *Annotated Checklist of the Birds of New Zealand* (OSNZ 1970), both of these records were relegated, as Parkes has already stated, to the " Suspense List." Now, with the establishment of a Rare Birds Committee by the Ornithological Society of N.Z., such alleged sight records doubtless would have been thoroughly examined before being committed to print. Nevertheless, the relegation, without reason, by the compilers of the 1970 list of two already published, and presumably accepted, records may be misleading in itself. The subsequent reader may wonder what the status of the 1947 and 1949 Ashley River records really is. Were they misidentifications of something else ? If so, what ? Or did the Checklist Committee have further information which enabled them to judge the situation ? The greatest weakness of such checklists is, in fact, that this sort of decision has to be made. Oliver (1954) has already drawn attention to the difficulties encountered by checklist committees in trying to arrive at taxonomic or in assessing changes in classification or status. It is worth recalling his words: " A committee set up to compile a checklist should be concerned mainly with nomenclature, that is deciding the validity of names and questions of priority. If the committee finds during its discussions that changes in classification or status are desirable, it should make them only if it gives reasons

for so doing and quotes original references . . ." (Oliver 1954: 190). The same philosophy holds good for the accepting or rejecting of previously published records, whether adequately documented or not. The *Annotated Checklist* continues the practices deplored by Oliver. For example, two alleged species may be merged (such as the subfossil eagles *Harpagornis assimilis* and *H. moorei* thought to represent sexual dimorphism of one species, but never documented or analysed to show it). The only sensible procedure for the compilers of such lists (unless they are expressly stated to represent the *status quo,* i.e. the names or decisions acceptable to the majority of practising ornithologists) is to make them truly " annotated " and give the reasons for changes in names of status indicating clearly which have been decided from published analyses (with references to the appropriate literature) and which by a committee opinion or vote as Oliver (1954: 191) said was done in the 1953 list. One special danger is that if forms are merged, polytypic species created, or their status decided upon categorically in such a way, further investigation of the truth may be stifled by the power of the printed word.

Parkes (1974) has now shown that the Grey Heron has its place in the New Zealand avifauna and can, therefore, be removed from the " Suspense List " under category " (a) " i.e. " old records . . . no longer verifiable . . . because specimens said to have been obtained are no longer traceable." However, the more recent sight records of herons seen at the Ashley River in 1947 and 1949 are now acknowledged by their perpetrator as belonging to category " (b) " i.e. " . . . unsupported by adequate evidence . . ." The White-faced Heron has now become, as is well known, a common bird in contrast with the rarity of the 1940s, and the recorder of the Ashley birds knows it rather better now than he did then.

The Pyramid Valley excursion had a sequel which is not irrelevant to the present discussion.

Early in the next year (i.e. 1948) I had to write the usual schoolboy essay on what I had done in the holidays, a task well known to all of us. I gave my impressions of that trip in the exalted company of several distinguished scientists, impressing my form master, the late Mr James Earl, sufficiently for him to persuade me to offer the essay to the school magazine which accepted it, thus making my first literary effort (Dawson 1948). Later, about the time of the Seventh Pacific Science Congress, when newspapers were eagerly reporting events of science, I was admonished by the leader of our expedition who said he was " surprised " that I should have given an interview about our Pyramid Valley experiences without first seeking his permission. I was mystified and protested, I believe in vain, my innocence. Subsequently I found that an article had appeared in an Auckland paper, *The New Zealand Observer,* in which the writer, a Mr Stuart Gregory, had interviewed a Mr E. W. Dawson, one of a party arranged to visit the Pyramid Valley moa swamp " to allow

Dr. Murphy to obtain first-hand information about the occurrence and excavation of the remains of the gigantic extinct New Zealand bird," an event which, according to Mr Gregory, erroneously led to Dr Murphy's inclusion by the National Geographic Society in a list of the most important exploration feats of the year.

The apparent interview contained phrases and descriptions just as they had appeared in my magazine article and it was evident that a journalist had had his copy provided for him from this source. Disturbed, as only the young might be, I wrote to the editor of the *Observer* to find out how Mr Gregory had obtained this interview without me being present. He replied that one couldn't expect a busy journalist like Mr Gregory to keep notes of everyone he had interviewed. I let the matter drop but I think I had made a reputation as an unauthorised seeker of fame. There is a lesson to be learned that not only are one's first literary efforts published in obscure places likely to be plagiarised (flattering though this may be) but that interviews are not always what they seem.

Recently I discussed with Mr Eric Blomfield, former Secretary to the company which published the *Observer*, the mystery about the activities of Stuart Gregory whose address or whereabouts I could never find, and I am most grateful for his help. It appears, from Mr Blomfield's recollections, that " Stuart Gregory " was, in fact, the pen-name of a writer prominent in the world of politics (but who had been editor of the *Observer* at the time of my inquiries) who wished to continue under a cloak of pseudonymity and whose identity I must still not reveal in deference to Mr Blomfield's wishes. Hence, the interview could not have taken place and although the 1947 record of the Grey Heron is perpetuated not only in the school magazine article but also by Mr Gregory, that is the end of it.

I have now exculpated myself as an unreliable member of an expedition on the counts of unintentional but irresponsible reporting of a phenomenon which did not exist and of the charge that I gave an unauthorised interview to a man who, as it happens, similarly did not exist. There is a moral somewhere in this cautionary tale.

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★

## CORRIGENDUM

In the paper by D. J. & C. J. Horning " Bird records of the 1971-1973 Snares Islands, New Zealand, Expedition," *Notornis* 21 (1): 13-24, March 1974, there is an error on page 18 under ' Sooty Shearwater ' — For ". . . on 17 May . . ." read ". . . on 1 May . . ." As the authors point out, the date is important.

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# NOTICE

## SUMMER SCHOOL OF ORNITHOLOGY

Preliminary notice is given that this will be held in Nelson from 18 to 25 January next. The School will be fully residential, with everything found — beds, bedding, food, and someone to prepare and cook it. A comprehensive course of lectures has been planned and two field days will be included, one in the bush and one on an estuary.

The cost will be between $35 and $40 for full residential tariff. The usual notice and enrolment form will be sent out with September " Notornis."

# PRESUMED ATTEMPTED BREEDING OF THE WHITE-WINGED BLACK TERN IN NEW ZEALAND

By R. J. PIERCE

ABSTRACT

A pair of White-winged Black Terns *(Chlidonias leucopterus)* nested at a South Canterbury lagoon during the New Zealand summer of 1973-74. One chick was hatched on the second attempt, but it apparently did not fledge. This is not only the first documented record of White-winged Black Terns nesting in New Zealand but also the first undoubted record for the entire Southern Hemisphere.

## INTRODUCTION

As a breeding species the White-winged Black Tern occurs sporadically across Eurasia from Hungary to the Pacific Ocean. Cramp (1970) has given a useful summary of this species. He remarked of its breeding distribution:

> " Its range begins in Hungary and extends eastwards, rarely extending above 55°N or below 40°N except in Iraq, right across to the shores of the Pacific, although there is a noticeable gap in central Siberia between the upper Ob and the east of Lake Baikal [see map on p. 1042]. Within this range its distribution is uneven. . . . Indeed its nesting may be so erratic, especially at the edges of its range, that there is some uncertainty as to precisely where it now breeds or has bred. This applies especially to some areas bordering the Mediterranean, but the most important question is whether it nests . . . in any part of tropical Africa."
>
> [Cramp 1970: 1042]

Comments on its alleged breeding in Africa have also been given by Williams (1963: 115-116).

On their migration, Cramp (1970) stated:

> " They leave their nesting areas early and by October have spread widely over Africa, reaching as far south as the Congo . . . Later they occur . . . south into South Africa . . . Less is known of movements from the eastern breeding range, but white-winged black terns pass through China to winter in Burma, Malaysia and even Australia and New Zealand."
>
> [Cramp 1970: 1043]

The *Annotated Checklist* (OSNZ 1970) summarises the status of this species in New Zealand:

> " Breeding Europe and Asia, migrating to southern hemisphere, including Australia and with some frequency New Zealand, where several have been known to over-winter, some in full breed-

ing plumage. Numerous sight records throughout New Zealand as far south as Southland."

[OSNZ 1970: 54]

On 16 December 1973 five White-winged Black Terns were found at the mouth of the Opihi River, South Canterbury (Fig. 1). Two of these birds were in full breeding plumage and subsequently nested on the lagoon front, making history as the first White-winged Black Terns to be found breeding in the entire Southern Hemisphere.

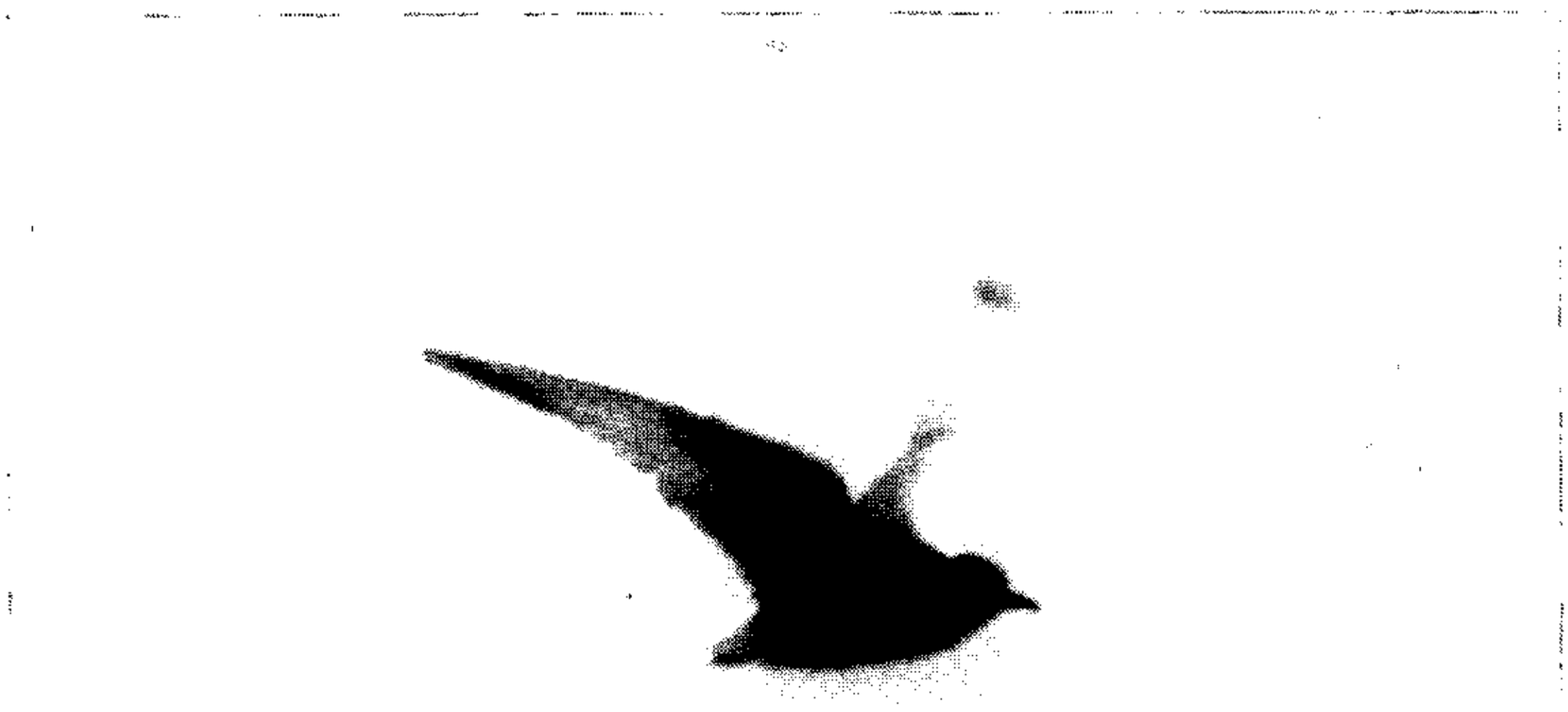

FIGURE 1 — White-winged Black Tern in full breeding plumage, 23 December 1973. Diagnostic features are: black extending along underwing from body; white forewing, and white tail.

Photo: R. J. Pierce

## HABITAT AND OTHER SPECIES PRESENT

At the mouth of the Opihi River, a narrow, branching lagoon (Milford Lagoon) parallels the shingle beach for about 2 km. The mouth is often blocked and the lagoon floods much of the adjacent riverbed and swampland, as was the case during much of the 1973-74 summer. At other times the lagoon is tidal with mudflats being exposed at low water. Much swamp vegetation occurs along the muddy-bottomed streams which enter the lagoon away from the main river. The beach is formed of flattened stones merging into shingle and sand on the lagoon front. Some parts of the lagoon front support growths of *Plantago coronopus* (plantain), *Chrysanthemum leucanthemum,* and other plants.

During the 1973-74 summer there was a nesting colony of c. 1200 White-fronted Terns *(Sterna striata)* on the beach. The occasional Caspian Tern *(Hydroprogne caspia)* fished the lagoon, particularly later in the summer. On the lagoon front there were two or three pairs of nesting Black-fronted Terns *(C. hybrida),* an

unusual nesting site in itself for this species. It was with these latter terns that the pair of *C. leucopterus* first nested. Up to four *C. leucopterus* in non-breeding plumage were seen at each visit. Moderate numbers of Black-backed Gulls *(Larus dominicanus)* and Black-billed Gulls *(L. bulleri)* were usually present, but no nests were found of these two species.

## NESTS

On 16 December 1973 two *C. leucopterus* in breeding dress were present at the *C. hybrida* nesting area among plantain and *Chrysanthemum*. One bird settled on a shallow depression which was empty and was never laid in.

On 23 December in the same vicinity a *C. leucopterus* tern was seen to come off a nest containing three eggs. The nest was situated five metres from the lagoon edge and about ten metres from the nearest *C. hybrida* nest. It was a very shallow depression in shingle beside a small *Chrysanthemum* plant. No nesting material was used (rather atypical of this species), and larger pebbles had been moved to the outside of the nest. The eggs were considerably smaller than those of *C. hybrida* and coloured glossy pale brown with dark brownish blotches concentrated at the larger ends. The clutch was still intact on 28 December when Mr D. Geddes of Methven visited the site. Disaster struck sometime after this date: on 13 January 1974 the nest, showing obvious signs of human interference, was found deserted and the adults, together with the Black-fronted Terns, had left the site.

A few hundred metres north along the lagoon front the *C. leucopterus* pair had renested. The nest, containing one egg on 13 January, was situated in a sandy area near marram grass, *(Ammophila arenaria)* and about fifteen metres from the lagoon. This nest consisted of marram grass, some of it growing in place, and other vegetation, all loosely shaped in a fashion more typical of the species. The clutch size of this nest remains uncertain; it may have been only a single egg as no sign of any more were found shortly after the chick had hatched. Late nests in the northern hemisphere tend to have two eggs (Cramp 1970: 1043).

On 6th February a chick (Fig. 2) aged about two or three days was present amongst marram grass beside the nest. The chick, still retaining its egg tooth, was richly coloured and gave an overall impression of being quite dark: upperparts streaked and blotched buff, black and grey; mainly black on the crown and paler on the 'wing.' A broad white circle surrounded the eye and extended to the forehead and base of the bill.

A visit on 21 February (about which time the chick should have been ready to fledge) found the nest site deserted. One of the adults was found roosting with other *C. leucopterus* and *C. hybrida*

FIGURE 2 — White-winged Black Tern chick at nest, 6 February 1974. Note the broad white circle around the eye.

Photo: R. J. Pierce

at the river's edge. No dark-saddled *C. leucopterus* (indicative of a juvenile) was found on later visits and it seems likely that the chick was lost.

## BREEDING BEHAVIOUR

Considerable friction was observed between the pair of *C. leucopterus* and adult *C. hybrida* during the initial stages of nest establishment (16 December). The latter species was usually the principal aggressor with incubating birds even leaving the nest to join in aerial combat. Less agitation was noted on 23 December, but both *C. leucopterus* pursued any gulls and terns that ventured overhead. The incubating bird was quick to return to the nest, hovering for a short time less than a half metre above the ground, in a manner similar to *C. hybrida,* before alighting. The two species were in apparent harmony on Mr Geddes' visit of 28 December.

On 6 February when the chick had hatched, an adult was in almost constant attendance at the nest. The other hawked insects over lagoon, beach, flooded paddocks and particularly over a permanent channel away from the main body of lagoon water. Insects were taken on and above the water surface and on one occasion the tern was seen to plunge headlong into the lagoon at a shallow angle, but the prey was not seen. During 140 minutes of observation the chick

was fed twelve times at irregular intervals, each feeding lasting 10-30 seconds. A change of parental roles occurred after 45 minutes; at the changeover the previously foraging bird landed beside the nest and executed a 360° turn of its body and the other bird flew off a few seconds later.

During the 140 minutes the foraging bird pursued intruders (gulls and White-fronted Terns) on fifteen occasions and on five of these was joined by the bird at the nest. In addition, an Arctic Skua *(Stercorarius parasiticus)*, which had flown over the nest area, was harassed by both parents, just as I arrived at the area on 6 February. Non-breeding *C. leucopterus* were generally not welcome over the nest site and were 'escorted' from the area by the foraging bird which sometimes directed a gentle dive toward them. These non-breeders did occasionally, however, join in the fray when the parent birds were defending the nest site from another species, and probably helped end such encounters sooner.

In defence of their nest site the terns were very noisy, uttering a rasping "graack" or "graack-grak" with loudness seemingly proportional to the urgency of the situation. More pleasant but still fairly strident notes were commonly given during flight. Only once was one of the non-breeding birds heard to call.

## PLUMAGE CHANGES

The adult terns (Fig. 1) had full breeding dress, a smart pattern of black, grey and white, in December and on 13 January (cf. Witherby *et al.*, 1941: 9-11, pl. 126). By 6 February the forehead and much of the crown (more so in one bird) was an off-white. The underparts were irregularly mottled with an area of white approximately equal to that in black. Smaller patches of white occurred on the mantle. On 21 February the head was white except for some grey on the crown and black about and especially behind the eye. The mantle was pale grey and the underparts all white except for a trace of black on the breast. On 18 March neither adult could be distinguished with any certainty from the non-breeding birds (see also figures in Cramp 1970: 1040-1041).

## DISCUSSION

Although White-winged Black Terns in breeding plumage probably appear annually in New Zealand (Falla *et al.*, 1970: 160, pl. 14, OSNZ 1970: 54), nesting has (till this summer) never been satisfactorily determined. Earlier this century Edgar Stead said that they had nested in Canterbury (Oliver 1955: 330). Lack of documented evidence resulted in this report being discounted in much of the literature. Between 1969-73 one White-winged Black Tern in breeding plumage was seen each summer at a Black-fronted Tern colony on the Cass River, Lake Tekapo. It was not seen at the Cass during the 1973-74 summer when the pair was found nesting at the Opihi River-mouth. Messrs B. R. Keeley and P. M. Sagar found a pair in

breeding plumage at Lake Wainono (50 km south of Opihi Mouth) in August 1967 (Cowie *et al.* 1968). Birds in non-breeding dress have frequently been seen by the author and other observers in recent years at Opihi Mouth and Lake Wainono (cf. Pierce 1972*a*, 1972*b*, 1973; Child 1973).

ACKNOWLEDGEMENTS

I wish to thank Jill Hamel and Dr R. F. Smith for assistance with the manuscript.

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[The manuscript of this paper was referred to the Rare Birds Committee who comment: "As this species has not been recorded breeding in the Southern Hemisphere the record can only be accepted as a possible record. It is hoped that further study will be able to confirm successful breeding." — Ed.]

# SEABIRDS OF EASTERN COOK STRAIT, NEW ZEALAND, IN AUTUMN

By J. A. BARTLE

ABSTRACT

The distribution and abundance of seabirds in eastern Cook Strait during autumn is described. Notes on identification and behaviour are also included.

Three coastal currents of mixed subtropical and subantarctic origin intermingle in eastern Cook Strait. Seabird assemblages of this region are dominated in autumn by large numbers of non-breeding migratory shearwaters from northern New Zealand. These birds leave in early May and are replaced by subantarctic species. White-capped Mollymawks, Salvin's Mollymawks and Giant Petrels are numerous in early autumn prior to their dispersal into the eastern boundary currents.

The seasonal variability of food for offal-feeding petrels is much less than for species which feed solely on pelagic organisms. This explains the rarity with which Flesh-footed Shearwaters, Cape Pigeons, Westland Black Petrels and albatrosses are cast ashore, and limits the value of storm-killed records as indices of petrel abundance.

CONTENTS



NOTORNIS 21: 135-166 (1974)

## INTRODUCTION

There have been no detailed studies on the distribution of seabirds over continental shelf waters in the central New Zealand region. Seasonal changes in density and species composition of the seabird flocks during autumn are very marked in this area, and this survey is concerned with such changes.

This paper summarizes observations on the seabirds of the eastern Cook Strait region (Fig. 1) made from the steam trawler *Maimai* between mid-February and mid-May 1966. Observations ranged from the Kairakau Rocks (approximately 40°S) and Castlepoint in the north to Banks Peninsula (about 44°S) in the south. Most were made off the Kaikoura Coast, particularly in the neighbourhood of Cape Campbell (Fig. 1). I have also included information on

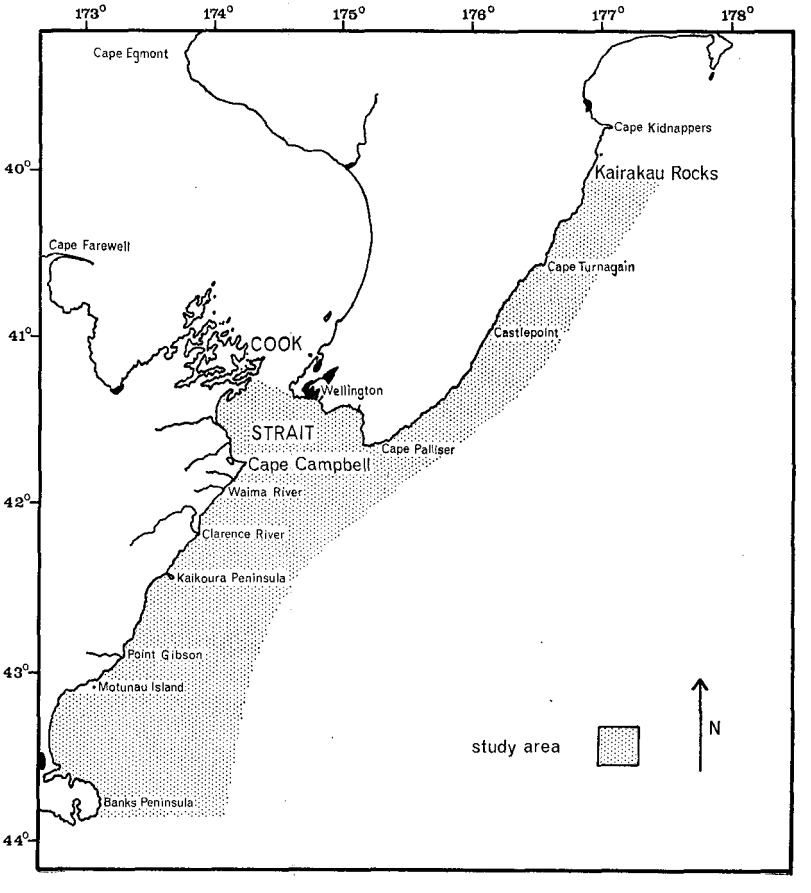


FIGURE 1 — The eastern Cook Strait region.

seabirds recorded off Castlepoint in May, July, and November 1965. For comparative purposes seabirds sighted in the western approaches to the Strait between 1960 and 1969 have been briefly discussed.

The valuable notes of Mr Fred Abernethy were freely used. These permitted a check of my conclusions against observations made in the same area nearly a decade earlier. Supplementary material from the Beach Patrol Scheme of the Ornithological Society of New Zealand was included by permission of the convener. Extensive records of " storm-killed " seabirds are kept by the scheme, and some species found dead on the shores of the Strait have not been identified at sea in the area.

## OBSERVATION METHODS

Between mid-February and mid-May 1966 the *Maimai* was fishing on an average of 4 days each week, with periods from 3 to 12 days being spent at sea. Up to 16 hours were spent working on deck each day, and few opportunities were missed to keep ornithological records.

In some respects fishing vessels are ideal seabird observatories. Large quantities of edible refuse in the form of fish viscera and heads as well as undersized and non-marketable fish are discharged overboard. This brings many seabirds close to the ship where detailed examinations can be made.

Not all seabirds are attracted to a vessel when refuse is thrown overboard. Of 23 species of seabirds recorded from the *Maimai,* 7 did not normally approach the vessel closely, and in one case specific identification using binoculars was impossible. However, 3 of these 7 species were attracted on board at night by the powerful floodlights used during night gutting and were examined in the hand. Sometimes birds drawn to daylight gutting also flew aboard accidentally. Once on board, these birds had great difficulty in clambering back into the sea, and were easily captured. Fifty-nine birds of 12 species were banded. Some were obtained when they flew aboard and others were snatched by the wingtip as they flew alongside. Most were caught using a dip net with a duralumin handle 4 metres in length and a mouth diameter of 1 metre. Birds around the trawler were watched with 8 x 40 binoculars whenever possible, but systematic observations could not be maintained.

## THE EASTERN COOK STRAIT REGION

Three main surface water movements give rise to the coastal circulation around New Zealand. To the south lies the West Wind Drift; to the north of the North Island, the Trade Wind Drift; and west of both islands, the Tasman Current. The coastal currents are derived from these water movements, together with the effects of local winds (Brodie 1960).

Subtropical and subantarctic waters meet at the Subtropical Convergence in the southern Tasman Sea. Most of the subtropical water lying north of the Convergence flows north along the west coast of New Zealand as the Westland Current (Fig. 2), but some

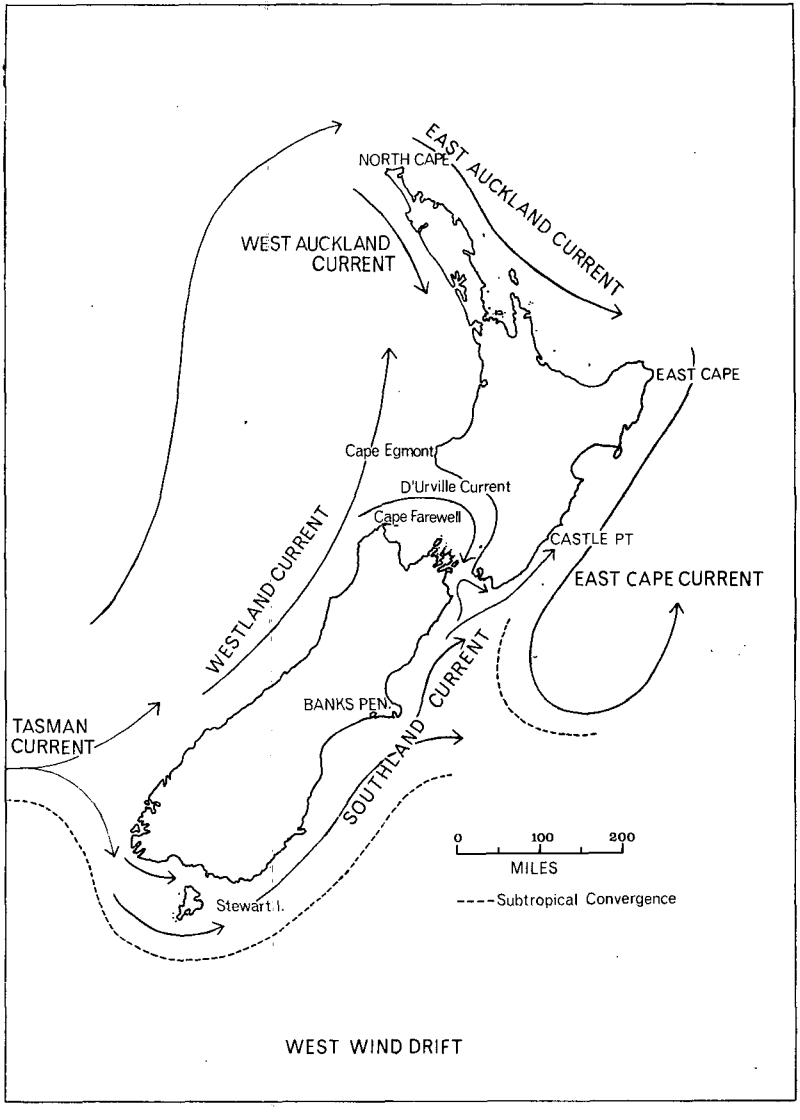


FIGURE 2 — Coastal circulation in the New Zealand region (diagramatic).

is deflected to the south around Stewart Island and through Foveaux Strait (Brodie 1960, Houtman 1966). This water and the subantarctic water associated with its offshore limits forms the Southland Current which flows up the east coast as far as Castlepoint and sometimes to Gisborne (Brodie 1960). The Southland Current sweeps through the eastern end of Cook Strait before passing northwards along the Wairarapa Coast (Heath 1969).

Associated with this current are a number of subantarctic seabirds. Truly migratory species, present in this cool water zone during summer, almost disappear on trans-equatorial migrations to the North Pacific during the southern winter.

The Westland Current arises as a branch of the modified subtropical water of the counter-clockwise circulation in the Tasman Sea (the Tasman Current). A strong indraught of this water from off Cape Farewell into Cook Strait is known as the D'Urville Current (Brodie 1960). This current transports warm surface water usually as far as the Cook Strait Narrows.

Derived from the East Auckland Current (Barker & Kibblewhite 1965), the south-flowing East Cape Current bounds the north-flowing Southland Current to the east. South of Castlepoint the warm water usually lies well offshore (Fig. 2). The exception to this is in the deep waters of the canyons near the coast at Cook Strait (Garner 1961, Heath 1971) and Kaikoura (Houtman 1965). Associated with this current are a number of seabirds which breed in northern New Zealand and thus both subtropical and subantarctic species intermingle in Cook Strait during autumn.

The land mass of New Zealand is set athwart what would otherwise be a zonal eastwards flow (with the West Wind Drift and the Trade Wind Drift lying well to the south and north respectively of New Zealand). The Subtropical Convergence lying between the subtropical and subantarctic water, is displaced in the New Zealand area. Surface isotherms representing the Convergence may be close together or widely spaced (Garner & Ridgway 1965), and the Convergence may be difficult to detect. Deacon (1945) suggested that the idea of a convergence region would be useful because the New Zealand area is one where the positions of sharp boundaries in water properties fluctuate, rather than one of gradual transition. Because water masses of such diverse origins affect the area, Cook Strait itself may be regarded as lying within such a region.

Deacon (1937) thought that the Subtropical Convergence approached the land near Cape Egmont to the west of New Zealand, but subsequent work showed that the Westland Current is basically subtropical (Brodie 1960). Thus the Convergence is more properly shown as marking the boundary between the Tasman Current and West Wind Drift west of New Zealand (Garner 1959, 1961) and between the East Cape Current and the West Wind Drift south and east of New Zealand (Burling 1961, Jillett 1969).

The system is complicated by the presence of subantarctic water at the surface north of Banks Peninsula (Garner 1961). This water mass was previously considered a branch of the West Wind Drift, but Heath (1972) found it to represent the cooler subsurface water of the Southland Current (which is essentially subtropical at the surface off Otago). Nevertheless, a convergence is recognized where this cooler Southland Current water meets the warmer water of the D'Urville Current to the west (in the Cook Strait Narrows) and the subtropical East Cape Current to the north and east (Garner 1959, 1961).

The Subtropical Convergence is well marked east of Banks Peninsula where subantarctic water is directed eastwards toward the Chatham Islands along the southern margin of the Chatham Rise (Burling 1961).

The most important bathymetric feature of the area, the Hikurangi Trench, extends south-westwards close to the coast of the North Island, and depths of over 2000 metres are reached only 80 kilometres offshore. The continental shelf off the south-east coast of the North Island is very narrow, and canyons are cut into the slope between Castlepoint and Kaikoura. The Hikurangi Trench gradually becomes shallower further south, and finally disappears near Banks Peninsula.

Warm tongues of surface and subsurface water extend into the Cook Strait and Kaikoura Canyons (Heath 1971), upwelling close inshore. These influence the plankton communities (Grieve 1966, Bartle 1972, Bradford 1972), and hence seabird densities.

Against this hydrological background (see also Brodie 1973, Heath 1973) it is apparent that studies based largely on transects across the Narrows (as was that of Secker 1969; also Fowler 1972) cannot provide a balanced picture of the seabirds in the Cook Strait area. The conditions which prevail in the Narrows are not typical of other areas within the Strait which are differently influenced by the three water masses.

Cassie (1960) remarked on the oceanic conditions which prevailed at Abernathy's stations off Castlepoint, Cape Campbell, Weld Cone and Kaikoura, and sometimes all of these stations were influenced by the same body of water (the Southland Current) and possessed similar plankton communities (see also Bartle 1972).

Gales are more frequent in Cook Strait than elsewhere in New Zealand except for Foveaux Strait (Watts 1947). The autumn pattern is one of violent storms alternating with prolonged periods of surprisingly calm weather. On less than half of the days when the *Maimai* was at sea during the study period was the average windspeed estimated to exceed 24 kts described by meteorologists as a " strong breeze."

## SYSTEMATIC ACCOUNT OF THE BIRDS

In this section each species observed from the *Maimai* is listed, with brief notes on numbers, distribution and behaviour. Other species which are known to occur in Cook Strait have been included, although not recorded during the present survey. The species are discussed under two headings — those which are normally attracted to refuse thrown overboard, and regularly follow ships; and, secondly, birds which are not usually attracted to waste discharges. Within each of the two sections nomenclature and systematic order follow the "Annotated Checklist of the Birds of New Zealand" (OSNZ 1970).

*1. Seabirds associated with trawlers:*

### WANDERING ALBATROSS *(Diomedea e. exulans)*

These birds were recorded regularly throughout autumn, but never in large numbers. Usually only one or two birds were seen on the outskirts of a voracious flock of 10-20 Royal Albatrosses. They seem less bold than this latter species, and perhaps refuse is less important in their diet. A large proportion of the Wandering Albatrosses in Cook Strait were in brown juvenile plumage, a feature also noted by Kinsky (1968).

### ROYAL ALBATROSS *(Diomedea epomophora)*

Moderate numbers of this albatross were present in Cook Strait, and both the Northern Royal Albatross *(D. epomophora sanfordi)* and the Southern Royal Albatross *(D. e. epomophora)* were seen regularly. The Southern Royal Albatrosses outnumbered the northern form by about 6 to 1, and this remained constant throughout autumn.

After some practice, it became easy to distinguish the subspecies at a glance. The northern form is distinctly smaller and there are no white feathers among the dark upper wing coverts, thus increasing the contrast between the dark upper wing and the white leading edge and back. The extent of dark upper wing coverts on *D. e. epomophora* was usually much less, although Serventy *et al.* (1971) exaggerated this feature in their descriptions and sketches and their account is very misleading. All upper wing coverts of the southern race have white tips, giving the dark upper wing surface a speckled appearance (F. C. Kinsky pers. comm.). This was found to be the most useful character for distinguishing between the two subspecies at sea.

The numbers of Royal Albatrosses seen in Cook Strait during this survey appear very high when compared with the results of Norris (1965) or Secker (1969). It seems that these workers may have been confusing Wanderers with Royals, for I have had many opportunities since 1966 to observe albatrosses in the area, and on every occasion the number of Royals has exceeded the number of

Wanderers. Most of my identifications have been made from trawlers at distances of 2-5 metres, and at this range the dark lines on the cutting edges of the mandibles of Royals are unmistakable.

Royal Albatrosses were largely diurnal and rested on the water upwind of the vessel as it drifted overnight. Nevertheless, they would come in to night gutting. Activity usually began about 2 hours before sunrise.

Richdale (1950) suggested that pairs associate at sea between breeding seasons. On many occasions " neck-nibbling," " trumpeting " and displays with outstretched wings were seen between pairs and trios.

BLACK-BROWED MOLLYMAWK *(Diomedea melanophris melanophris)*

All adult Black-browed Mollymawks which could be subspecifically identified were of the southern dark-eyed form. My later observations have shown that the honey-eyed *D. m. impavida* has a more northerly distribution in New Zealand coastal waters, and is rarely seen off the east coast south of East Cape. Significantly, 5 out of the 7 long-distance recoveries of banded *impavida* have come from the tropical Pacific (Robertson 1972, 1973), close to the northern extreme of the winter range for Black-browed Mollymawks determined by Summerhayes (1969). Banding evidence thus supports the hypothesis of a more northerly autumn and winter range for *impavida,* not only in coastal waters, but throughout the South-West Pacific. However, the nominate race is not confined to the cool Southland Current, for I have also seen a few dark-eyed adults in northern waters.

Mr F. Abernethy (pers. comm.) did not record Black-browed Mollymawks in the area during early summer, his earliest record being on 19 February 1957 at Cape Campbell. I could not make observations during early summer, but my first record on 22 February 1966 (also at Cape Campbell) agreed well with Abernethy's findings. Secker (1969) noted the absence of the species from the Narrows in early summer.

Black-browed Mollymawks were never seen in large numbers, but regular sightings were made after the middle of March. It was rare for more than 2 or 3 to come in to gutting.

An unexpected feature was the high incidence of birds with juvenile plumage. At least 2 birds in 3 had variable juvenile markings (see also Kinsky 1968). The youngest birds seen had completely dark underwings, grey heads and necks, and dark grey bills. In older birds the axial streak of the underwing lightens and the grey head and neck become white. At this age the bill is usually flesh-pink, with a black tip to both mandibles. An anomalous individual was seen with adult plumage but a slate coloured bill showing irregular

patches of yellow. This was probably an immature bird (Murphy 1936). The abundance of birds with juvenile plumage suggests that Cook Strait is a wintering ground for juvenile birds.

This species is almost entirely diurnal (see also Murphy 1936) and rarely came in to night gutting. The birds were rather shy and did not usually approach the boat very closely, being easily intimidated by the larger White-capped and Salvin's Mollymawks.

BULLER'S MOLLYMAWK *(Diomedea bulleri)*

This small mollymawk is rarely cast ashore on Wellington beaches, and is generally not common in Cook Strait during autumn. However, numbers are higher to the south (Norris 1965), and groups may appear irregularly close inshore (Secker 1969). None were seen until 28 March 1966 at Cape Campbell. This compares well with Mr F. Abernethy's earliest record (21 March 1957), also at Cape Campbell. Abernethy thought that the species was totally absent from the Strait during summer, but Secker (1969) provided records from mid-December onwards. It is rare, however, to see more than lone birds until late April.

Maximum numbers of Buller's Mollymawks were observed from the *Maimai* off Point Gibson, which was not a regular fishing ground. This species is not associated with the fishing grounds to the same extent as the large mollymawks and great albatrosses, which were almost absent from Point Gibson in April.

Buller's Mollymawks were the shyest of the mollymawks which came in to gutting. They kept out at the edge of the flocks and were chased away by the larger mollymawks. More frequently Buller's Mollymawks flew about the stationary vessel without alighting amidst the mass of birds squabbling over offal. Norris (1965) also noticed their reluctance to follow vessels for any length of time, and no flying birds were seen from the *Maimai* at night.

WHITE-CAPPED MOLLYMAWK *(Diomedea c. cauta)*

The inappropriately-named Shy (or White-capped) Mollymawks were the largest, boldest and most common of the mollymawks in the area. They were especially numerous off the Kaikoura Coast, and offal from trawlers must form the major part of their diet in Cook Strait.

When only one fishing vessel was at sea the local population, usually spread around 6 trawlers, converged on one boat. The estimated 800 birds of this species which came in to morning gutting at Cape Campbell on 28 March 1966 indicates the size of the local population. White-capped Mollymawks are largely diurnal, but can be active during night gutting. They rest on the water overnight, becoming active about 2 hours before sunrise. During the day large numbers follow trawlers, awaiting the disposal of waste.

White-capped Mollymawks breed only on islands in Bass Strait and off Tasmania, as well as at the Auckland Islands (Serventy *et al.* 1971). The breeding season does not end until early March (Falla *et al.* 1966) on these distant islands, whereas numbers of White-capped Mollymawks are highest in Cook Strait during late summer. By early May densities have greatly decreased.

Increased numbers of adult White-capped Mollymawks in Cook Strait during the fledgling period may reflect a northward dispersal of non-breeders. Pairs were often seen engaged in typical courtship activities such as " neck-nibbling." This seemed contagious, and would often spread to a dozen pairs in a small flock. Prolonged courtship such as this is a feature of non-breeding petrels (Bartle 1968). Similar dispersals occur within other species, for Richdale (1963) showed that unemployed Sooty Shearwaters *(Puffinus griseus)* also leave the nesting grounds at the fledgling stage of the breeding cycle. Cook Strait may be a summer feeding area for the non-breeding White-capped Mollymawks which disperse more widely during the winter (Serventy *et al.* 1971).

SALVIN'S MOLLYMAWK *(Diomedea cauta salvini)*

Salvin's Mollymawks are easily (and reliably) distinguished from adult White-capped Mollymawks by the possession of a dark mandibular unguis, which can be seen from a considerable distance. Other characters (especially bill colour and the grey head and neck) are less reliable for distinguishing Cook Strait populations of *salvini* in autumn from the nominate race and may explain the paucity of sight records of *salvini from* Cook Strait. The few birds which Secker (1969) sighted were probably juveniles and newly moulted adults with their characteristic grey heads since he did not record them until April. In late summer the grey of the head and neck is usually reduced by abrasion to a pearly grey wash on the face and neck contrasting with the white crown (*salvini* moults in February according to Kinsky 1968). Many birds have the whitish heads which were once thought to characterize a separate subspecies, *layardi,* but these were considered by Murphy (1936) and later workers to be the result of plumage wear. The bill in Salvin's and White-capped Mollymawks is also very variable in colour, ranging from greyish shades through a horn colour (perhaps predominant) to flesh and yellowish tones. The overall bill colour of *salvini* is not always darker than *cauta cauta,* as stated by Serventy *et al.* (1971). Bill colour is especially unreliable for distinguishing juvenile birds, but, as with the White-capped Mollymawk, birds in juvenile plumage are rarely seen in Cook Strait during autumn. Juvenile Salvin's Mollymawks have been seen with a grey head and neck and a grey bill with dark tips to both the upper and lower mandible.

Numbers of Salvin's Mollymawks were consistently lower than those of the White-capped Mollymawk. Usually the ratio is about 1:2. For instance, on 28 March 1966 when an estimated 800 White-capped

Mollymawks were seen following the *Maimai,* there were about 300 Salvin's Mollymawks as well. This subspecies is much less frequently washed ashore on the Wellington coast than *cauta cauta,* but the wreck of nearly 40 *salvini* in February 1947 (Cunningham 1948) showed that there were large numbers in the Strait at that time

Both White-capped and Salvin's Mollymawks are essentially birds of the cool Southland Current and West Wind Drift, and both are less frequently seen in the western approaches to Cook Strait. However, the location of trawling grounds may also be a factor in restricting their distribution. The reduced number of Salvin's Mollymawks in Cook Strait during the winter can be accounted for by an eastward dispersal into the eastern boundary currents of the South Pacific and South Atlantic. They have been regularly recorded from the Peru Current and the Benguela Current, mainly during May and June (Murphy 1936).

The feeding relationship between this subspecies and the White-capped Mollymawk is interesting. Invariably the peck order is determined by size, and the slightly larger subspecies prevails.

CHATHAM ISLAND MOLLYMAWK *(Diomedea cauta eremita)*

This distinctive subspecies breeds only on Pyramid Rock in the Chatham Islands. Records away from the seas adjacent to the breeding area are exceedingly few (Imber 1966) and probably represent stragglers rather than any definite dispersal. Nevertheless, the small total population (cf. Dawson 1973: 226) must be taken into account, especially when compared with other mollymawks. The east coast of the South Island was included within this subspecies' range in the *Annotated Checklist of the Birds of New Zealand* (OSNZ 1970), but Imber (1966) listed only 2 records for the area.

An adult Chatham Island Mollymawk was seen on 23 February 1966 near Cape Campbell. The chrome yellow bill and sooty head and nape were clearly seen on several occasions. During the next few days this bird was attracted in to gutting, but it was not a particularly voracious scavenger compared with the White-capped and Salvin's Mollymawks.

GIANT PETREL *(Macronectes giganteus)*

The Northern Giant Petrel *(M. g. halli)* had not been clearly differentiated from the nominate race at the time of this survey. The following observations probably refer to a mixed population consisting of both subspecies although very few pale adults were seen from the *Maimai,* or by Secker (1969).

I had been expecting to see large numbers of this well-known scavenger but the population in the open sea was surprisingly small. McIlwaine (1964) described the large flocks which occur at the outlet

to the Ngauranga freezing works in Wellington Harbour; and many hundreds of Giant Petrels once congregated at the Tory Channel Whaling Station (Dawbin 1948: 19). But in 1956-57, while the Whaling Station was still operating, Mr F. Abernethy rarely saw more than 6 Nellies at once in the open sea, and I never recorded more than 4 together during the autumn of 1966. These low numbers contrast with the flocks of up to 110 birds sometimes recorded by McIlwaine off Ngauranga in March.

Giant Petrels (or Nellies) were less frequently seen by day and usually followed the ship's wake. Nellies came in to gutting at night and were shy and difficult to catch. These birds always retreated when challenged by ane of the mollymawks. Nearly half of the Nellies wore bands which may suggest that the same birds return to particular wintering grounds over many years (see also Kinsky 1958).

Giant Petrels are found in Cook Strait at all times of the year (Bull & Boeson 1961a, 1961b, 1963; Boeson 1964; McIlwaine 1964; Secker 1969) and no consistent changes in numbers were observed over autumn. McIlwaine made a detailed study of seasonal trends in the numbers of Giant Petrels (from 1958 to 1962) off Ngauranga, in Wellington Harbour. A very high correlation was found between the number of Nellies and the amount of offal, with peak numbers of Nellies between November and February. She accounted for their reduced abundance in autumn and winter by proposing that the birds left Ngauranga and fed across Cook Strait at the Tory Channel Whaling Station where the whaling season lasted from March to August. Unfortunately McIlwaine obtained no actual counts of Giant Petrels at Tory Channel and was unable to verify her suggestion. After the Whaling Station had permanently closed, Secker (1969) made counts from Ngauranga which showed exactly the same pattern, with fewer birds in autumn and winter. Hence McIlwaine's concept of a fairly constant number of Giant Petrels in Cook Strait must now be incorrect. Secker's explanation of the September-December peak in numbers as the result of higher air and sea temperatures is also untenable. Minimum sea temperatures are not reached until September in Cook Strait (Bartle 1972) and, in any case, Giant Petrels are denizens of waters with predominantly subantarctic characteristics (Murphy 1936).

Although little information is available, it seems that the departure of the large spring and summer population of mainly non-breeding Giant Petrels from Cook Strait may be associated with a winter dispersal pattern similar to that of the *Diomedea* species which obtain a large part of their food by scavenging. Few Nellies were seen north of New Zealand by Summerhayes (1969) in winter and P. E. Roberts (pers. comm.) in summer suggesting an east-west dispersal rather than a latitudinal movement. Banding recoveries (Robertson 1972) also support this interpretation.

A surprising observation, which Abernethy (pers. comm.) confirmed, was that Nellies are more common along the eastern coast of the North Island (south of Kairakau Rocks) than off the east coast of the South Island (north of Banks Peninsula). On 4 April 1966 Nellies were very common just north of Cape Palliser, but only an occasional bird was to be seen off the Kaikoura Coast (only 65 kilometres south) later in the day. During a week's observation of seabirds from the shore at Castlepoint (3-9 July 1965) Nellies were the only petrels recorded. On most days they could be seen flying north or south along the coast either singly, or in groups of up to four. Often they came quite close inshore, within 100 metres of the beach. The records of Norris (1965) also show these trends, yet from an oceanographer's viewpoint these areas appear very similar, with mixed Southland Current water carrying characteristic planktonic organisms (Bartle 1972) along the continental shelves off both coasts.

SNARES CAPE PIGEON *(Daption capensis australis)*

All the Cape Pigeons seen from the *Maimai* in autumn were of this dark-backed subspecies which breeds in the New Zealand subantarctic region. Adults of the nominate race always have a much whiter back despite varying effects of plumage wear (see Murphy 1936: Fig. 58). *Daption c. capensis* is present in Cook Strait in small numbers later in the year as more recent observations and band recoveries have shown.

Cape Pigeons are normally absent from Cook Strait in summer and early autumn. None were observed by Abernethy (pers. comm.) after 7 December in 1955 and 20 December in 1956, and the last birds to be caught had started to moult (see also Murphy 1936). In 1956 Cape Pigeons returned to the trawling grounds in Cook Strait on 10 April (Abernethy). Ten years later the first Cape Pigeons were seen from the *Maimai* on 28 February, but only scattered birds were noted before mid-April. An average of 30 birds followed the vessel and came in to gutting during the rest of April and early May. Mr Abernethy has told me that an increase from 30 to 500 in the number of birds coming in to gutting can be expected by late May, and a further jump to 1000 birds may occur in early June. A similar peak of abundance in winter also occurs off South America (Murphy 1936) and in Australian seas (Serventy *et al.* 1971). But since the closing of the Tory Channel Whaling Station winter populations of Cape Pigeons in Cook Strait may have declined (Bartle unpubl.).

A high proportion of Cape Pigeons still carried bands nearly 10 years after the intensive banding efforts of Mr Abernethy off Cape Campbell and others at the Whaling station. Between 10% and 30% of the many hundreds of Cape Pigeons sighted were banded. Three recoveries were made from the *Maimai* of birds previously banded in Cook Strait, supporting the idea that Cape Pigeons return to the same wintering grounds year after year.

Cape Pigeons seem equally active by night as by day. They will come in to night gutting and differ from albatrosses and mollymawks in following the ship if it is under way at night. When the *Maimai* was drifting at night Cape Pigeons could be seen flying around at the edge of the pool of light cast by the floodlamps. Unlike Nellies and Westland Black Petrels, Cape Pigeons came boldly in to daytime gutting as well. They frequently engaged in courtship activities such as neck-nibbling at these times.

WESTLAND BLACK PETREL *(Procellaria westlandica)*

The numerous accounts of the oceanic distribution of southern seabirds contain few references to this robust species and I have therefore summarized all available information on the identification, distribution and behaviour of the Westland Black Petrel at sea. The species was not described until 1946 and during the next decade the only records away from the breeding grounds were of lone birds which had flown aboard the inter-island ferry between Wellington and Lyttleton in winter. In recent years an extensive distribution in the Tasman Sea and into Cook Strait became apparent from scattered storm-killed specimens found on beaches near Wellington and Auckland (e.g. Kinsky 1968, Imber 1971) and New South Wales (McGill 1959). A few sight records such as those of P. E. Roberts (pers. comm.) have confirmed this extensive distribution west of New Zealand and extended it to 29°S in summer.

The Westland Black Petrel is easily confused with other large dark petrels at sea, especially those with dark underwings and pale bills. Species likely to be confused with Westland Black Petrels in Cook Strait include Black Petrels *(Procellaria parkinsoni)*, White-chinned Petrels *(Procellaria aequinoctialis)* and Flesh-footed Shearwaters *(Puffinus carneipes)*. My observations of Westland Black Petrels at many places around the New Zealand coast suggest that the paucity of earlier observations is mainly the result of incorrect identifications. For example, the " large black petrels with dark underwings (and) feet, no grey face, bill yellow horn coloured with black tip " recorded by Dell (1960) as moderately common between Banks Peninsula and Wellington in February 1959 must have been *westlandica* and not *parkinsoni* as he thought. The pale yellowish latericorn and ramicorn contrast with the blackish nails of the upper and lower mandibles in *westlandica* and can be seen at some distance. This is the most reliable way of distinguishing these birds from Black Petrels which have more evenly coloured bluish bills.

Bill colour is also important for separating *westlandica* from *aequinoctialis*. White-chinned Petrels with very little white on the chin occur regularly in New Zealand waters, although none were seen from the *Maimai*. The white feathers on the chin may not always be visible from the side and the birds can appear uniformly black. Birds without any white on the chin are also known from the New Zealand

area (Oliver 1955). But the yellowish nails of both mandibles of *aequinoctialis* can be seen at sea and form the most useful character for distinguishing between *westlandica* and *aequinoctialis.*

In flight, the Westland Black Petrel has a similar build to the Flesh-footed Shearwater. The wings appear longer, but the most distinctive features of *westlandica* are the darker plumage and paler bill. The bill of *westlandica* is noticeably pale because of its large size in relation to the head. The glossy feathers under the wing do not appear pale as in *carneipes,* and flight patterns are similar except that the aerial manoeuvres of the larger petrel seem more measured.

When resting on the water Westland Black Petrels float high, like gulls, giving them a distinctly fat appearance with heavy, rounded lines. The species does not look to be much larger than a shearwater, but the fat appearance is characteristic. White-chinned Petrels also float high (Murphy 1936).

In autumn Westland Black Petrels are black compared with the worn brownish plumage of the Flesh-footed Shearwaters. The contrast between the species is especially noticeable on the breast. Under a bright light, the head and neck of *westlandica* seem darker than the rest of the body.

In addition to the dark underwing, the shorter neck and broader wing distinguish the Westland Black Petrel from the other dark shearwaters, particularly the Sooty Shearwater *(Puffinus griseus).* The flight also involves much less flapping than with the Sooty Shearwater.

Westland Black Petrels are quite variable in size. Few measurements are available, but the largest individuals handled were estimated to be 50% heavier than the smallest. These variations were also reflected in bill size. All birds examined appeared to be adult and comparable variation in size can be found among adults on the breeding colony (Bartle unpubl.).

Mr. F. Abernethy was the first to positively identify Westland Black Petrels at sea, in the spring of 1956. He observed individuals off Kairakau Rocks and near Cape Campbell. The species was seen coming in to gutting in small numbers. Abernethy recorded Westland Black Petrels during September and October, with a last record for the season from Cape Campbell on 5 November 1956. There are few records of Westland Black Petrels in New Zealand waters after the end of the breeding season in December, and it is possible that the birds disperse northwards during summer.

Birds reappear on the breeding colony in late March to clean out burrows (Bartle unpubl.) and Westland Black Petrels can be seen in Cook Strait from then onwards. My earliest record is of a number seen on the night of 21 March 1966 at Cape Campbell, and P. E. Roberts (pers. comm.) has also noted their reappearance at sea

off the breeding grounds at this time. In Cook Strait numbers remained fairly low during March and early April and the birds did not usually approach the ship by day. During late April and May the species can be seen regularly, although rarely in large numbers. Up to 30 birds often come in to night gutting in May.

The Westland Black Petrel is now known to be evenly distributed throughout the eastern approaches to Cook Strait. Numbers seen off Kairakau Rocks and Banks Peninsula are as high as at Cape Campbell, and I have subsequently recorded birds as far north as East Cape (Bartle unpubl.). The range therefore includes virtually all of the cooler waters off the east coast of New Zealand which support a sizeable trawl fishery.

Early in the season the birds seemed shy and only congregated about the *Maimai* at night. They often remained on the outskirts of the pool of light cast by the vessel's floodlights, feeding on the planktonic animals attracted to the surface by the light. By late April numbers of Flesh-footed Shearwaters and Westland Black Petrels around the ship at night were about equal, but as the Flesh-footed Shearwaters began their northward migration the larger species predominated. Westland Black Petrels were more frequently seen following the ship and coming in to gutting by day as the season advanced. The boldness of the birds increased, and by mid-May the population was consuming considerable amounts of offal.

It seems that the number of Westland Black Petrels which frequent trawling grounds has increased during the last 20 years. Abernethy never recorded more than 8 birds together in 1956-1957 whereas I often counted 30 birds coming in to gutting in 1966. More recently (May 1968) several hundred birds have been seen together in central Cook Strait (Bartle unpubl.), while Secker (1969) did not record any there before 1965. These observations suggest that either the species is extending its range, or that the total population is increasing (or both). On the other hand, the apparent increase in the numbers of Westland Black Petrels on the trawling grounds may reflect an increasing dependence on offal for food.

The possibility of such a change occurring in a petrel population was shown by Fisher (1952) who described how the Fulmar *(Fulmarus glacialis)* had greatly increased in the North Atlantic. Fisher attributed this to additional food supplies from the fishing and whaling industries.

Jackson (1958) estimated the total population of Westland Black Petrels on the breeding grounds in 1955 to be between 3000 and 6000 birds. Although the area of the breeding colony has become reduced in recent years my estimate (based on counts and capture-recapture data) of the total population at the colony in 1972 was 6000 to 10,000 birds (Bartle unpubl.). Thus there is some evidence that the total population of Westland Black Petrels has increased perhaps because of the additional food supplies provided by trawlers.

FLESH-FOOTED SHEARWATER *(Puffinus carneipes)*

In summer and early autumn this shearwater is the most abundant of the seabirds which feed on offal from trawlers in Cook Strait. Very few are cast ashore and beach records give no indication of their numbers. Up to 1000 Flesh-footed Shearwaters could be seen following the vessel in March, but by early April numbers were reduced, with fewer than 50 birds coming in to gutting. On 5 May 1966 these shearwaters abruptly disappeared. This hiatus represented the reparture of the species on migration to the North Pacific and no birds were seen after this date.

Cook Strait populations of Flesh-footed Shearwaters are largely confined to the main trawling grounds. Whereas large numbers could be seen off Cape Campbell and north of the Clarence River mouth, few were seen off Cape Palliser and Point Gibson, or in Clifford Bay (only 30 kilometres from Cape Campbell). Banding results suggest that these populations on the trawling grounds were probably mainly non-breeders from colonies in northern New Zealand. Five Flesh-footed Shearwaters banded in Cook Strait have been recovered near breeding colonies in the Bay of Plenty (Kinsky, 1958, 1959). However, nearly 50 birds were recaptured by Abernethy on the fishing grounds where he had banded them (Kinsky 1957, 1958), suggesting a return to the same feeding areas after the trans-equatorial migration.

Flesh-footed Shearwaters are strongly diurnal. They did not follow the *Maimai* when it was under way at night, unlike Cape Pigeons. Only a few birds came in to night gutting and these individuals seemed wary. Some birds fed on the plankton attracted to the sea surface under the ship's lights.

BLACK-BACKED GULL *(Larus dominicanus)*

Black-backed Gulls were rarely seen more than 8 kilometres offshore. Several dozen of these gulls usually accompanied the *Maimai* when fishing in Clifford Bay, off the Clarence River mouth, or near Kaikoura Peninsula. Gulls were rare on the trawling grounds 20 kilometres off Cape Campbell. Norris (1965) also noted their restriction to inshore waters. None were observed in eastern Cook Strait at night, although some follow inter-island rail ferries across the Narrows by night as well as by day.

RED-BILLED GULL *(Larus novaehollandiae scopulinus)*

In the open waters of Cook Strait Red-billed Gulls have a distribution similar to Black-backed Gulls. Red-billed Gulls were, however, usually present in larger numbers and up to 70 were often seen off Kaikoura Peninsula where there is a large breeding colony. A high proportion of the diet of gulls which breed near Kaikoura may be made up of planktonic animals (Mills 1969) captured close inshore, and Red-billed Gulls are less voracious scavengers than Black-

backed Gulls. Numbers remained fairly constant throughout autumn, and no mass movements were observed along the coasts.

2. *Birds which rarely follow vessels*
   (a) Seabirds

NORTHERN BLUE PENGUIN *(Eudyptula minor subspecies)*

This penguin has a widespread breeding distribution along the shores of Cook Strait. Scattered birds were recorded close to the coast but were difficult to see except on calm days. A few individuals were observed up to 20 kilometres offshore. No seasonal changes in numbers were noted.

GREY-HEADED MOLLYMAWK *(Diomedea chrysostoma)*

Assessment of the abundance of Grey-headed Mollymawks in Cook Strait by beach records alone would be very misleading. Over many years storm-killed corpses of this species have far outnumbered other mollymawks (Bull & Boeson 1961a, 1961b, 1963; Boeson 1964; Imber 1971) except after the cyclone of April 1968, when none was found (Kinsky 1968). Yet Grey-headed Mollymawks are not common in Cook Strait during autumn, and none was seen from the *Maimai*, or by Norris (1965). This absence of records may be partly caused by the unwillingness of this mollymawk to follow vessels and feed on offal (J. M. Moreland pers. comm.) although these birds regularly feed on galley refuse in other areas (Murphy 1936).

Abernethy (pers. comm.) and Secker (1969) saw small numbers at sea in Cook Strait. Secker recorded Grey-headed Mollymawks most frequently in the areas of tidal turbulence through the Narrows, where they fed in association with prions and shearwaters.

ANTARCTIC PRION *(Pachyptila desolata desolata)*

On the night of 22 March 1966 a bird of this species flew aboard the *Maimai* north of the Clarence River mouth. It was tentatively identified as being a member of the nominate race from Kerguelen Island on the basis of bill shape. The bird was banded and released.

Although *P. desolata alter* is perhaps the most frequently occurring Antarctic Prion in New Zealand waters (P. E. Harper pers. comm.), immature vagrants from the Kerguelen Island population of Antarctic Prions are occasionally found dead on New Zealand beaches (Harper 1972), usually during winter. Several species of prions which breed in the subantarctic zone of the Indian Ocean occur off the New Zealand coast in winter, sometimes in large numbers. During summer and autumn these species are usually absent and the only prions frequently cast ashore are Fairy Prions.

FAIRY PRION *(Pachyptila turtur)*

The Fairy Prion is one of the most common petrels in Cook Strait. Many thousands were often seen, especially on windy days. Prions were encountered throughout the area, but were much more abundant further than 8 kilometres from the coast. Secker (1969) noted this trend and also found that, within the Narrows, prions were largely confined to areas of tidal turbulence. A tendency to feed upwind along areas of tidal turbulence was apparent off the Kaikoura Coast, but prions were not limited to these areas.

Extraordinary short-term variations in abundance occurred over both time and space. It is difficult to detect any relationship between prion numbers and the availability of the planktonic components of their diet in the Cook Strait area (Bartle 1972 and unpubl.). Temporal variations in abundance may occur on an hourly basis and need not follow the tidal cycle as Secker (1969) suggested. Sometimes prions were absent for several days and then thousands would suddenly appear.

These irregular short-term variations in abundance masked long-term trends and no definite seasonal changes were recorded. An impression that Fairy Prions were less common in April and May is contrary to beach patrol evidence for dead Fairy Prions are more frequently picked up after April (Bull & Boeson 1961a, Kinsky 1968, Imber 1971).

Prions do not follow fishing vessels and tended to avoid the *Maimai*. They were very active at night and were often seen flying about on the perimeter of the light cast by the ship. Harper believes that many prions feed at night, and his account of the feeding behaviour of *Pachyptila belcheri* in subantarctic waters (Harper 1972) precisely describes the feeding patterns seen in *P. turtur* in Cook Strait. Unlike *P. belcheri,* Fairy Prions also feed voraciously by day.

BULLER'S SHEARWATER *(Puffinus bulleri)*

Buller's Shearwaters were the most frequently seen seabirds in eastern Cook Strait during autumn. They were distributed evenly throughout the area and it was exceptional to encounter dense flocks as with Fairy Prions or Sooty Shearwaters. Because of these differences in distribution patterns Fairy Prions and Sooty Shearwaters far outnumbered Buller's Shearwaters at times but, over the whole season, the latter species predominated.

These findings show that Secker (1969) was mistaken in describing Buller's Shearwater as a "rare passage migrant" in Cook Strait. But Abernethy (pers. comm.) saw fewer Buller's Shearwaters in Cook Strait between 1956 and 1958, and Jenkins (1947) has recently presented evidence showing that this species has greatly extended its range and abundance in southern coastal waters. Norris (1965) did not see any of these shearwaters south of Cape Palliser in 1962, whereas by 1966 they were often to be seen from the *Maimai* as far south as Banks Peninsula, and individuals now occur regularly in Foveaux Strait (Jenkins 1974).

Buller's Shearwaters breed only on the Poor Knights Islands which lie in subtropical waters off the east coast of northern New Zealand at 35°30'S. They are trans-equatorial migrants, most birds returning to New Zealand waters in early September (Vooren 1972) and leaving in early May. Eggs are laid on the Poor Knights Islands during late November and early December with a peak on 29 November (Bartle unpubl.).

Vast numbers reach northern waters in September and slowly spread down the coasts during October and November (Jenkins 1974). Buller's Shearwaters favour the open waters of the continental shelves and are less common within 2 kilometres of the coast (Bartle unpubl.) or more then 60 kilometres offshore (Jenkins 1974).

The seasonal pattern in Cook Strait shows anomalous features which I have interpreted as reflecting the activity of non-breeding birds. Non-breeding Buller's Shearwaters sometimes spend the summer in the Peru Current (Murphy 1936, P. C. Harper pers. comm.) and the birds which dally in the North Pacific into November (Murphy 1936) must be non-breeders despite their enlarged gonads.

Although I recorded Buller's Shearwaters from the western approaches to Cook Strait in October 1961 and November 1963, in 1956 the first birds did not reach Cape Campbell until 17 December (F. Abernethy pers. comm.). Numbers increase slowly during summer and a peak of abundance is attained between February and May. Decreased numbers of Buller's Shearwaters in the Bay of Plenty after January are thought to reflect an exodus of non-breeding birds from the area (Vooren 1972). Richdale (1963) showed that the numbers of unemployed Sooty Shearwaters frequenting the nesting grounds were much reduced after February, and an analogous pattern may be expected in *bulleri* which has a similar breeding cycle and a high proportion of unemployed birds on the breeding grounds (Bartle unpubl., C. M. Vooren pers. comm.). Hence the peak in numbers of Buller's Shearwaters in Cook Strait between February and May corresponds with a decline in northern waters and probably represents a southward dispersal of non-breeders.

Buller's Shearwaters remained abundant in Cook Strait until the last week of April and all birds disappeared abruptly on 2 May 1966. Two birds were seen in Clifford Bay on 23 May 1966, nearly 3 weeks after the main departure. Jenkins (1974) has 3 records of birds in northern waters in June, and between June and August at least 16 Buller's Shearwaters have been found dead on New Zealand beaches (Bull & Boeson 1961a, 1961b, 1963; Boeson 1964, Imber 1971). However, some of these corpses may have been dead for many weeks when found.

This evidence suggests that small numbers of Buller's Shearwaters overwinter in New Zealand waters. These could be inexperienced juvenile and non-breeding birds and recent observations

(mid-May 1971) show that significant numbers of Buller's Shearwaters continue to visit their breeding grounds in winter (Bartle unpubl.). My conjecture that these are non-breeders whose hormonal cycles have been disrupted by failure to find a nesting site or mate must remain speculative in the absence of a detailed breeding study.

Buller's Shearwaters do not usually follow ships or come in to gutting although there are cases of exceptional behaviour as on 23 May 1966 when birds were feeding on fish offal.

SOOTY SHEARWATER *(Puffinus griseus)*

Sooty Shearwaters were seen throughout the Cook Strait area although, unlike the other shearwaters, they were rarely sighted within 8 kilometres of the coast. In early autumn numbers were highest in the centre of the Strait.

Seasonal patterns of distribution and abundance in this trans-equatorial migrant are different from the other large shearwaters which occur in the area. Whereas the main breeding grounds of Buller's and Flesh-footed Shearwaters are in northern New Zealand, the breeding grounds of the Sooty Shearwater are widespread. Small colonies are found from the Three Kings Islands southwards, but the largest colonies are in Foveaux Strait and in the subantarctic zone. Hence there is a resident population of Sooty Shearwaters in Cook Strait with huge flocks passing through on migration.

In summer and early autumn large numbers could be seen, sometimes in flocks stretching to the horizon, but on most occasions, Buller's Shearwaters outnumbered Sooty Shearwaters by a ratio of about 5:1. In May, however, seemingly endless streams of Sooty Shearwaters pass through Cook Strait, with individuals flying close together and in one direction. These streams may be as narrow as several hundred metres but, in the course of several hours, many thousands of birds will pass.

Richdale (1963) documented the return of Sooty Shearwaters to their breeding grounds in Foveaux Strait in late September. Further north, at Pipinui Point on the western shore of Cook Strait, I found them clearing out burrows two weeks earlier (Bartle unpubl.). Abernethy (pers. comm.) observed groups of up to 50 birds off Kairakau Rocks on 30 August 1956, and those may have been locally breeding birds which had just arrived.

A very different seasonal pattern is evident from observations made on the wintering grounds in the North Pacific. Off the California coast numbers are highest in September, with a peak of abundance south-east of Hawaii during September and October (King 1970). These birds must be non-breeders and, in fact, large numbers of un-employed birds do not appear on the breeding colonies until the onset of egg-laying, in late November (Richdale 1963). The vast numbers of Sooty Shearwaters encountered by Abernethy (pers. comm.) off Kairakau Rocks on 3 October 1956 may have been non-breeders passing southwards to the nesting grounds.

According to Richdale, unemployed birds leave New Zealand waters in early April, with most of the breeding birds following later in the month. By the end of the first week in May nearly all chicks have left their burrows (Richdale). A peak in the number of Sooty Shearwaters south-east of Hawaii in March (King 1970) may represent the early arrival of the unemployed birds. Therefore it appears that migratory behaviour changes with age and breeding status and this explains some of the variations in abundance at sea.

The numbers of Sooty Shearwaters in Cook Strait remained relatively constant until 29 April 1966. All birds seen prior to this date had the worn brown plumage characteristic of adults nearing the end of their breeding cycle, in contrast to the sooty black of the newly fledged young. During the next 10 days numbers of Sooty Shearwaters decreased until they were almost entirely absent. This decline probably represented the departure of the locally breeding adults. On 9 May the first dark-plumaged juveniles appeared and numbers built up rapidly until 12 May when thousands of juveniles migrating from their southern nesting grounds passed through Cook Strait.

None was seen after this date except for a few birds which came in to gutting on 21 and 23 May 1966. As in the case of Buller's Shearwater, I believe that these were probably overwintering non-breeders. Ninety-eight Sooty Shearwaters have been found on New Zealand beaches between June and August (Bull & Boeson 1961a, 1961b, 1963; Boeson 1964; Imber 1971).

Sooty Shearwaters are not normally attracted to fishing boats, but during the autumn migration up to 6 birds at a time came in to gutting. They fed voraciously on fish offal and followed the *Maimai* for many hours. Most (but not all) of these birds were juveniles.

FLUTTERING SHEARWATER *(Puffinus gavia)*

Fluttering Shearwaters are abundant in Cook Strait and storm-killed specimens may be found at nearly all times of the year. The species breeds on several islands in the Strait and most of the birds seen at sea probably nest locally (Oliver 1955).

It proved to be impossible to differentiate *P. gavia* from the closely related *P. huttoni*. Although *gavia* and *huttoni* are said to be distinguishable at sea under good conditions these small shearwaters tended to avoid the *Maimai* and never fed on fish offal. I have grouped records of these shearwaters into a single category referred to as "*gavia/huttoni*" but fear that this method of lumping observations has concealed differences in behaviour.

Nearly all sightings of "*gavia/huttoni*" were made within 5 kilometres of the shore. Both Norris (1965) and Secker (1969) commented on the inshore distribution of Fluttering Shearwaters in Cook Strait. *P.* "*gavia/huttoni*" were much more common in the

Narrows than off the exposed Kaikoura Coast which supports Secker's contention that Fluttering Shearwaters favour inlets and bays rather than the open sea.

Fewer "*gavia/huttoni*" were seen in Cook Strait during late summer and early autumn, in accordance with Secker's observations and beach patrol evidence. During April and May "*gavia/huttoni*" were recorded particularly frequently because the *Maimai* spent relatively more time fishing within 8 kilometres of the coast.

HUTTON'S SHEARWATER *(Puffinus huttoni)*

Hutton's Shearwater breeds at an altitude of more than 1200 metres in the Seaward Kaikoura Range. Six young Hutton's Shearwaters were attracted by the ship's lights and flew aboard the *Maimai* on dark misty nights (22-24 March 1966) as we were trawling off the Waima River, 65 kilometres north of the main breeding colony. These birds had apparently flown straight from the nest as they still bore some down. Young birds fresh from their burrows are regularly attracted on board the inter-island ferries as they pass along the Kaikoura Coast (Falla *et al.* 1966).

WHITE-FACED STORM PETREL *(Pelagodroma marina maoriana)*

This species is very rarely seen at sea in eastern Cook Strait despite the presence of breeding colonies on Sentinel Rock and Motunau Island. Few specimens are washed ashore and no White-faced Storm Petrels were picked up after the cyclone of April 1968 (Kinsky 1968). None was seen in the area by Norris (1965), Secker (1969), or from the *Maimai,* although Abernethy (pers. comm.) saw the occasional bird. White-faced Storm Petrels generally feed well out to sea (Richdale 1965), especially after the chicks hatch in late November (Vooren 1972). The species is absent from coastal waters after the end of the breeding season in February (Falla *et al.* 1966, Vooren 1972).

NORTHERN DIVING PETREL *(Pelecanoides urinatrix urinatrix)*

There are sizeable Diving Petrel colonies on several islands at the western entrance to Cook Strait and this species can usually be seen over the tide rips nearby. Inshore waters close to the breeding grounds are favoured and few birds fly south through the Narrows into eastern Cook Strait. None was recorded by Secker (1969) during 24 crossings of the Narrows, yet they are common around The Brothers islands only 17 kilometres to the north.

One Diving Petrel was seen from the *Maimai* in Clifford Bay and Abernethy (pers. comm.) saw scattered flocks in eastern Cook Strait in spring and summer. Only one specimen was found on the southern coast of the North Island after the cyclone in April 1968 (Kinsky 1968) reflecting the rarity of this species in eastern Cook Strait during autumn.

AUSTRALIAN GANNET *(Sula bassana serrator)*

Large numbers of gannets nest at Cape Kidnappers, north of Kairakau Rocks. They are very common off the east coast of the North Island in autumn and many fly westwards through Cook Strait into the Tasman Sea. There are no breeding colonies off the east coast between Cape Kidnappers and The Nuggets (Otago) and gannets are rare in the cooler waters of the Southland Current between Cape Palliser and Banks Peninsula. None was seen off the Kaikoura Coast in autumn although Abernethy (pers. comm.) has a few records from Cape Campbell.

Gannets are essentially birds of inshore waters and fly very close to the rocky shores of the Wellington and Wairarapa Coasts. Few birds are seen more than 3 kilometres from the coast-line.

SKUAS (*Stercorarius* species)

Three skuas occur in Cook Strait. Arctic Skuas *(S. parasiticus)* are regularly seen in summer and Pomarine Skuas *(S. pomarinus)* have also been recorded (Heather 1972). The Southern Skua *(S. skua lonnbergi)* is seen less frequently than the Arctic Skua.

All three species are more often associated with the warm D'Urville Current than with the Southland Current. I have seen Arctic Skuas and Southern Skuas on many occasions north of the Narrows, but skuas were recorded only once from the *Maimai,* when a pair of Arctic Skuas were seen in Clifford Bay on 9 May 1966. Abernethy (pers. comm.) also found skuas to be relatively rare in eastern Cook Strait.

WHITE-FRONTED TERN *(Sterna striata)*

This common and widespread coastal species is rarely recorded offshore although small flocks can sometimes be seen as far out as the Cape Campbell trawling grounds (15-25 kilometres offshore).

(b) Land birds

SOUTH ISLAND FANTAIL *(Rhipidura f. fuliginosa)*

On 24 March 1966 a fantail flew on board the *Maimai* 8 kilometres off the Waima River mouth. The *Maimai* was surrounded by dense sea mist at the time. At first the fantail was disorientated, but it proceeded to catch small winged insects in the scuppers and showed no inclination to leave. About 7 hours after the fantail had joined the vessel the mist dispersed and the bird departed towards the shore, flying strongly.

SILVEREYE *(Zosterops l. lateralis)*

Silvereyes have colonized many outlying islands and now occur widely in the New Zealand subantarctic zone (OSNZ 1970). Individual birds and small flocks were often seen in the rigging of the *Maimai* when we were within 5 kilometres of the coast. Unlike the fantail, Silvereyes never stayed on board for more than a few

minutes. Silvereyes were usually seen on board in misty weather, but this was not invariable. Sometimes small passerines, probably of this species, were seen by the ship's lights at night.

## GENERAL ASPECTS OF BEHAVIOUR AND DISTRIBUTION

### *1. Changes in numbers of petrels during autumn*

Of the 21 species and subspecies of Procellariiformes seen in eastern Cook Strait during autumn, 11 breed in the subantarctic region and 10 breed either locally or in northern New Zealand. The autumn seabird communities are dominated by large numbers of unemployed migratory shearwaters which nest outside the area. The most striking seasonal change occurs when these shearwaters leave in early May and are replaced by petrels from the subantarctic zones of the South-West Pacific and Indian Oceans. A visual indication of this transition can be obtained from Fig. 3, which shows the seasonal variation for 6 selected summer-breeding species. Three of these nest in the sub-antarctic zone and overwinter in coastal waters and the others are shearwaters which breed in New Zealand and migrate to the North Pacific during the southern winter. Daily changes in numbers are not plotted and the diagrams are smoothed to emphasize overall trends. Although the changes in abundance are shown relative to the highest numbers of each species, the various widths of the kite diagrams are not comparable between species. For instance, never more than 8 Buller's Mollymawks were seen together, yet the maximum width of the diagram for Sooty Shearwater abundance represents more than 10,000 birds per day.

Taniguchi & Nishizawa (1971) found that the seasonal peak of primary productivity occurs at different times in the mixed subantarctic and subtropical water where they meet east of Cook Strait. Primary productivity in mixed subantarctic water is three times greater in summer, but the primary productivity of subtropical water is highest in winter. The life cycles of some planktonic organisms on which petrels feed in Cook Strait are adjusted to produce maximum abundance following these phytoplankton peaks (Bartle 1972). This suggests that the shearwaters which breed in subtropical waters during summer can maximize their use of food resources by concentrating in cooler waters during autumn. Petrels which breed in subantarctic waters in summer achieve similar efficiency by moving into subtropical waters during winter to reach a peak there in early spring. Nevertheless attempts at relating petrel abundance to plankton biomass (Jespersen 1929, Bailey 1966) can be very misleading in the absence of detailed information on seabird diets and the specific composition of plankton. Peaks of plankton biomass in the upper 200 metres of the sea are often caused by the prevalence of species unavailable as food for petrels.

Trawling provides food for seabirds in areas where they might otherwise face starvation. Seasonal changes in the distribution of seabirds which feed on offal need not be related to the abundance of pelagic organisms. Among the species attracted to trawlers the

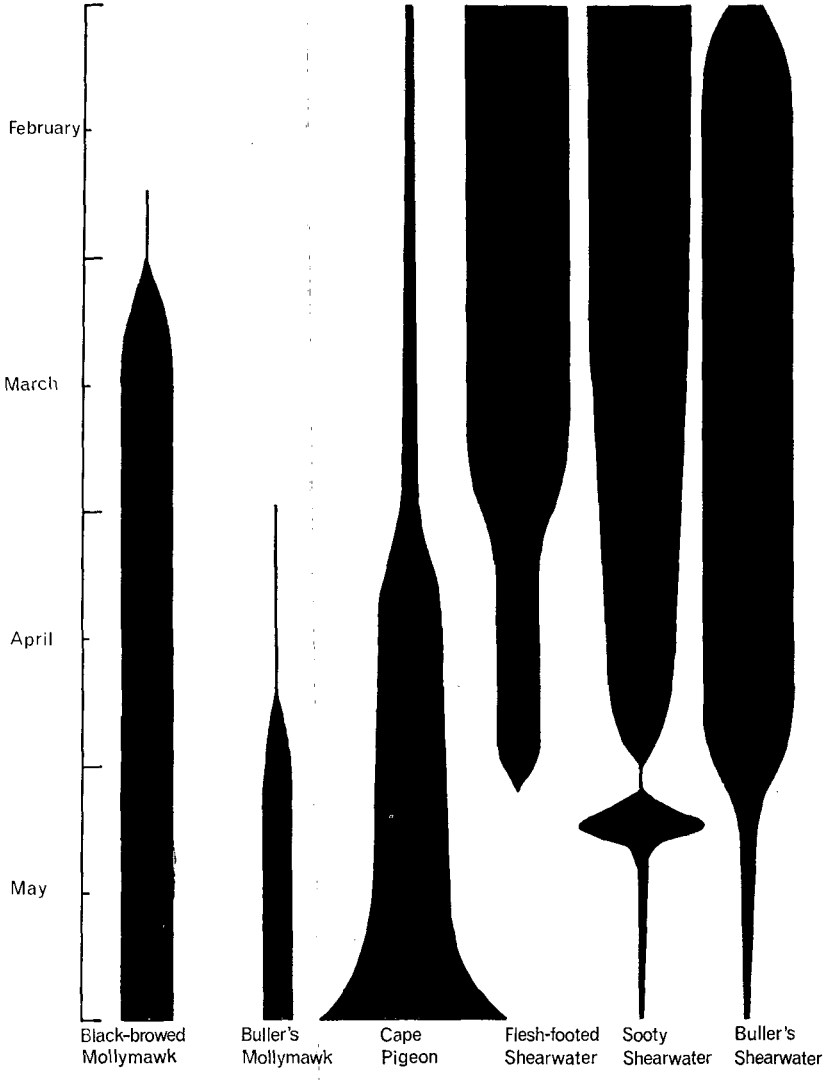


FIGURE 3 — Seasonal changes in numbers of some Cook Strait Procellariiformes.

most noticeable change occurs in the abundance of Flesh-footed Shearwaters and Cape Pigeons. Flesh-footed Shearwaters are very common until their departure in early May whereas moderate numbers of Cape Pigeons appear in mid-April and the full size of the overwintering population is not reached until June.

2. *Distribution and behaviour of petrels which do not usually follow ships*

The distribution and abundance of petrels which feed mainly on pelagic organisms showed wide variations within the limited area of eastern Cook Strait. Wind seemed to be the proximate factor governing the pattern of distribution in coastal waters. Moderate winds are needed so that petrels can obtain enough lift from the updraughts caused by waves to reach the airspeeds necessary for gliding flight (Jameson 1958). Large numbers of Sooty and Buller's Shearwaters as well as Fairy Prions were very rarely seen in calm weather although strong winds did not always lead to their reappearance. On calm days in the Hauraki Gulf rafts of petrels are often seen resting on the sea surface. However, rafting behaviour was rare in Cook Strait and on windless days the petrels must feed elsewhere.

Throughout New Zealand coastal waters a constant pattern of inshore and offshore seabird communities is evident. The inshore belt, extending from the coast to 8 kilometres offshore, is characterised by the presence of Fluttering Shearwaters and Diving Petrels. Blue Penguins, gulls, terns and gannets are almost entirely confined to this region. The offshore belt, which extends further than 8 kilometres offshore, is characterised by Fairy Prions and Sooty Shearwaters. Buller's Shearwaters occur throughout both zones.

3. *Behaviour and abundance of offal-feeding species*

Enormous numbers of seabirds may be attracted to a trawler if it is the only one working the grounds. For instance, at morning gutting on 28 March 1966 about 2,150 Procellariiformes of 11 varieties were counted nearby. These included 800 White-capped Mollymawks, 300 Salvin's Mollymawks, and about 1000 Flesh-footed Shearwaters. Later in the season when the number of mollymawks and Flesh-footed Shearwaters had declined, Abernethy recorded up to 1000 Cape Pigeons following his vessel.

These birds can differentiate between a trawler and a coaster of similar size. If the trawler while on passage passed a coaster close by, birds would detach themselves from the coaster and follow the trawler in increased numbers.

When the net is being hauled, the birds invariably congregate on the starboard side where the cod-end will come up. This is almost always the windward side, but when there was no wind scavenging seabirds still clustered off the starboard side of the *Maimai* showing that they can differentiate between the bow and stern of a stationary trawler. Although expectant seabirds will gather to starboard even when no net is being hauled, the clatter of the winch always caused a rapid increase in the number of scavengers by the ship's side.

Because a relatively constant amount of fish refuse is discharged throughout the year, the seasonal variability of food for offal-feeding

species is much less than for species which feed wholly on pelagic organisms. This has wide implications for the population dynamics of offal-feeding species and may explain the rarity with which Flesh-footed Shearwaters, Cape Pigeons, Westland Black Petrels and albatrosses are cast ashore on beaches when compared with the abundance of storm-killed pelagic feeding shearwaters and prions. The highest rates of mortality occur among the immature non-breeders (Serventy *et al.* 1971). Yet it is this age group of offal-feeding species which is conspicuously abundant around trawlers in Cook Strait during late autumn, and these birds may thus build up food reserves which enable them to withstand the storms which kill many thousands of pelagic-feeding seabirds of similar age in winter. Hence the value of beach mortality records as indicators of the birds present at sea is limited.

Variations in the activity of offal-feeding petrels cannot be correlated with the number of fishing vessels at sea or with the weather but seem part of a rhythm caused by overeating when food is available, followed by periods of abstinence.

Before the advent of whaling and fishing all petrels must have fed almost entirely on pelagic organisms. Some species quickly adapted their behaviour to gain maximum advantage from these new sources of food. If one assumes that the abundance of petrels is ultimately limited by food, it seems that albatrosses, Nellies, Cape Pigeons and Flesh-footed Shearwaters must have increased in numbers. Other species may be in intermediate stages of behavioural adaptation. The Westland Black Petrel, for instance, normally feeds intensively on fish offal, but would often glide past the ship, taking no interest in gutting. This species seemed especially shy in early autumn and preferred to feed on the plankton under the ship's light rather than the fish offal nearby. Perhaps Sooty Shearwaters, which occasionally come in to gutting, will become increasingly dependent on this source of additional food.

Among the offal-feeding species at the ship's side there is much squabbling over the ample food supply, which is such that many times the present population of offal-feeding species could be supported were it not for the wastage. Nevertheless, it is interesting to note that the peck-order is based solely on size, the larger species obtaining preference. It seems likely with the reduction of fish waste at sea and the introduction of factory trawlers that the first offal-feeding petrels to suffer will be the smallest.

## ACKNOWLEDGEMENTS

Mr Fred Abernethy's pioneer work from the trawler *Thomas Currell* inspired this survey. I am especially grateful to Fred Abernethy for making available his unpublished notes and for critically reading the manuscript.

Mr F. C. Kinsky devoted many hours to help with identification and useful advice and encouragement. In between spells at sea I

also had profitable discussions with Sir Robert Falla and with Mr J. Moreland of the National Museum. Pat Bartle provided invaluable help with typing and proof-reading, and F. C. Kinsky, P. E. Roberts, P. C. Harper and J. Jenkins kindly criticized the manuscript. Dr R. A. Heath read and modified the section on "The eastern Cook Strait region." This paper was completed at the National Institute of Oceanography in Cochin (India) by kind permission of the Officer-in-Charge, Dr M. Krishnan Kutty.

I am indebted to Skipper John Cardno and fellow crew members of the *Maimai* for their forbearance while I made these observations. Many interesting sightings were supplied by my shipmates.

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*Mr J. A. Bartle,*
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*Wellington 1*

# ANNUAL GENERAL MEETING 1974

The 35th Annual General Meeting of the Society was held in Wellington on the 18th of May, and was attended by over 60 members.

The President, Mr Kinsky, in his report to the meeting outlined some of the more exciting ornithological happenings of 1973. A new species for New Zealand was the Antarctic Petrel, three of which were collected during beach patrols. The possible breeding of several rare species was awaiting confirmation. The Society's membership had increased by 32 during the year, giving a total of 1104. A financial profit of $832 was realised, but the President explained how this was due solely to a record sale of Christmas cards. Reports from Scheme Organisers and Committee Conveners were read in a summarised form, and tribute was paid to them and Regional Representatives for their time and effort devoted to the successful running of the Society. It was announced that Council had appointed three new Regional Representatives, Miss Joan Douglas (West Coast), Mr Max Falconer (Wellington) and Mr Tony Crocker (Waikato).

The four vacancies on Council were filled by the four nominations received. Mr A Blackburn resigned at the end of his term on Council, the vacancy being filled by Dr P. C. Bull. Mr F. C. Kinsky (President), Mr B. D. Bell (Vice-President) and Mr D. V. Merton were re-elected unopposed. The President explained that Mr P. D. Gaze was co-opted as Secretary on the recent departure of Dr Fowler. The meeting confirmed his position until the end of the original term.

Numerous amendments to the Constitution, four of which were passed in some form, occupied much of the meeting. Two of the resolutions will affect many members. Provision is made for Family Members who being in the same family as an Ordinary Member, pay 50% of the standard subscription, and have full rights of ordinary membership except that they shall not receive the publications of the Society. Amendments also resulted in the removal of previous restrictions, which prevented Junior Members from being elected to Council.

A successful motion proposed by Mr F. H. Boyce resulted in a 50% increase in subscriptions as from the 1st of January 1975.

Two Junior Member Awards were made to John Cockrem of Hamilton and Hugh Robertson of Palmerston North. John has contributed regularly to the Bird Mapping and Nest Record Schemes as well as carrying out original ornithological work. Hugh has played an active role in all the Society's schemes, particularly Beach Patrolling of which he does 140 miles a year. His regular attendance at study courses and field trips, even to the Chathams, has resulted in a keen and competent ornithologist.

The highlight of the evening was the election of Sir Robert Falla as an Honorary Life Member of the Society, which was accompanied by a standing ovation. The President made mention of Sir Robert's 32 years service to the Society on Council, and the benefit received from his deep ornithological knowledge and his administrative ability and guidance. We all hope that he may long continue being the guide, mentor and friend to all our members.

Arrangements for two Labour Day Week-end courses were made. In the North Island a survey of the Black-fronted Dotterel will take place on the Manawatu river beds. A more diverse survey of Otago river beds is being organised by Mr B. D. Bell in conjunction with current work by the Wildlife Service. It is proposed to have a residential Summer Course in Nelson in mid-January.

A meeting of Regional Representatives on Saturday morning was well attended. The opportunity to discuss problems and achievements in particular regions was welcomed. It is hoped to establish closer relationships between regions, and to help with research projects through a new " Field Investigation Committee."

During the afternoon an appreciative audience listened to illustrated talks by Mr R. B. Sibson on the numbers of migratory waders visiting New Zealand, Mr B. D. Bell on research being conducted on the Chatham Islands and Mr R. H. Taylor who offered some ideas on speciation in New Zealand Parakeets.

On Sunday morning a large party visited Cape Turakirae at the entrance to Wellington Harbour. Although the area was not of great significance to the ornithologist, an outline of the unique geological features given by Dr C. A. Fleming, a view of the seals and a chance to chat with old and new acquaintances proved to be a pleasant conclusion to the week-end.

P. D. GAZE, Hon. Secretary

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# TREASURER'S REPORT
## For Year Ended 31 December, 1973

PRESENTED AT THE A.G.M. OF THE
ORNITHOLOGICAL SOCIETY OF N.Z. (INC.)
WELLINGTON — 18 MAY 1974

The membership at the end of the year was 1104, an increase of 32 for the year. Details are: 1 honorary life, 78 life, 22 endowment, 702 ordinary, 68 student, 93 corporate bodies, 70 husband and wife, counting as two, making the total of 1104. 109 new members were admitted, 38 went out due to resignation or death and 39 were deleted as being unfinancial.

The income for the year was $7086, this is an increase of $1116 on last year's figure. Members' subscriptions increased by $159. Although the cost of printing the Christmas cards was markedly higher, a tremendous increase in the number sold returned a satisfactory profit of $1455, which is an all time record, an increase of $840 on last year's profit. Without this increase, the year's workings would have resulted in a deficiency instead of a surplus. Sales of back numbers showed an increase og $62. Interest received increased by $30 and dividends an increase of $34.

Expenses totalled $6254, a decrease of $301 on last year's amount of $6554. The cost of printing and distribution of *Notornis*

was $5047, an increase of $109 on the cost of the four regular parts for 1972. Some back numbers of *Notornis* were reprinted at a cost of $275. Other expenses, the cost of running the Society, $941 is $16 less than last year's figure of $957.

Over all the surplus for the year's working was $832 which has been transferred to the Accumulated Fund.

Royalties on the revised edition of the *Field Guide* amounting to $645 were received during the year and were credited directly to the Projects Assistance Reserve Fund.

During the year the Society's holding of shares in the Farmers Trading Co. and Alex Harvey Industries Ltd. were sold. The Farmers Trading Co. sale realised a profit of $136 and the Alex Harvey Industries sale a profit of $351. These amounts have been credited directly to the Accumulated Fund.

The amount of the realisation, together with $1000 from a maturing Auckland Hospital Board loan and $1000 which was on term deposit with the Bank of New Zealand, was reinvested with the Perpetual Trustees Co. Ltd., on authorised trustee investment returning 8% interest. $2000 is secured by mortgage on a commercial property situated in Queen St Onehunga and $2000 on a property of residential flats situated in Eden St, Dunedin.

The Society has $3883 invested in shares in public companies; at 31st December the market value was $5954. 250 bonus shares were received from Golden Bay Cement Co., 250 from Winstone Ltd, and 77 from Wattie Industries Ltd. In November the 168 convertible notes on General Foods were converted into 108 Wattie Industries ordinary shares.

Local body stocks with a maturing value of $3000 costing $2923 are held.

H. W. M. HOGG, Hon. Treasurer

THE ORNITHOLOGICAL SOCIETY OF N.Z. INC.

BALANCE SHEET AS AT 31 DECEMBER 1973

| 1972 | | 1973 | |
|---|---|---|---|
| | CURRENT ASSETS: | | |
| 687 | Cash at Bank of New Zealand | 2729 | |
| 497 | Bank of N.Z. Savings Account | 756 | |
| 3000 | Term Deposit Bank of N.Z. | 1500 | |
| 100 | Stock of *Notornis* | 100 | (Note III) |
| 100 | Stock of *Biology of Birds* | - | (Note III) |
| 4384 | TOTAL CURRENT ASSETS: | | $5085 |
| | INVESTMENTS AT COST: | | |
| 5388 | Shares in Public Companies | 3883 | (Note IV) |
| 3888 | Local Body Stocks | 2923 | |
| 3000 | The Perpetual Trustees Co. Ltd Group Trustee Investments | 7000 | |
| 12276 | TOTAL INVESTMENTS: | | 13806 |
| 1000 | Library at Valuation | (Note III) | 1000 |
| 17660 | TOTAL ASSETS: | | 19891 |
| | LESS LIABILITIES: | | |
| 1190 | Amounts owed by Society | 1371 | |
| 425 | Subscriptions in Advance | 365 | |
| | RESERVE FUNDS: | | |
| 1582 | Projects Assistance Reserve | 2227 | (Note V) |
| 1510 | Life Subscriptions | 1756 | |
| 1000 | Publications | 1000 | |
| 5707 | TOTAL LIABILITIES: | | 6719 |
| 11953 | VALUE OF ACCUMULATED FUNDS AS BELOW: | | 13172 |
| | ACCUMULATED FUNDS: | | |
| 12537 | Balance at 31/12/72 | 11953 | |
| | Less Stocks Biology of Birds written off | 100 | |
| | | 11853 | |
| | Plus Profit on Sale of Shares: | | |
| | Farmers Trading $136 | | |
| | Harvey Industries 351 | | |
| | | 487 | |
| 584 | Surplus for year | 832 | |
| 11953 | BALANCE AT 31 DECEMBER 73: | | 13172 |

We report, that in our opinion, the foregoing accounts and notes attached of THE ORNITHOLOGICAL SOCIETY OF N.Z. (INC.) for the year ended 31 December 1973 are in agreement with the books and reports of the Society and give a true and fair view of the Society's position at that date and the results of its transactions for the year. The Society has kept proper books and supplied all the information required.

DUNEDIN : 6 March 1974

THOMPSON & LANG, Chartered Accountants & Auditors

THE ORNITHOLOGICAL SOCIETY OF N.Z. INC.

STATEMENT OF ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 1973

| 1972 | | 1973 | |
|---|---|---|---|
| $ | INCOME WAS EARNED FROM: | $ | |
| 3893 | Subscriptions | 4052 | |
| 167 | Transfer from Life Members | 195 | (Note I) |
| 41 | Donations | 78 | |
| 615 | Profit from Christmas cards | 1455 | |
| 207 | Sale Back numbers | 269 | |
| 137 | Biology of Birds | 81 | |
| 5060 | TOTAL ORDINARY INCOME: | | $6130 |
| | PLUS INVESTMENT AND OTHER INCOME: | | |
| 562 | Interest | 592 | |
| 269 | Dividends | 303 | |
| 47 | Premium on Maturity of Local Body Stock | 35 | |
| 32 | Royalties | 20 | (Note II) |
| - | Booksellers Margin on direct Checklist sales | 6 | |
| 910 | TOTAL INVESTMENT & OTHER INCOME: | | $956 |
| 5970 | TOTAL INCOME: | | $7086 |
| | LESS EXPENSES: | | |
| | *Notornis* Printing & Distribution | 5047 | |
| | Less advertising | 9 | |
| | | 5038 | |
| 18 | Annual General Meeting | - | |
| 100 | Audit Fee | 100 | |
| - | Beach Patrol Scheme | 67 | |
| 10 | Distribution Scheme | - | |
| 152 | General Expenses | 126 | |
| 40 | Kermadec Reprints | - | |
| 50 | Library Expenses | 50 | |
| 38 | Nest Record Scheme | - | |
| 72 | Postages | 98 | |
| 175 | Printing & Stationery | 204 | |
| 10 | Recording Scheme | - | |
| 20 | Royal Society Affiliation | 20 | |
| 272 | Travelling Expenses | 276 | |
| - | *Notornis* Reprinting | 275 | |
| 6554 | TOTAL EXPENSES: | | 6254 |
| 584 | DEFICIENCY SURPLUS FOR YEAR TRANSFERRED TO ACCUMULATED FUND: | | $832 |

THE ORNITHOLOGICAL SOCIETY OF N.Z. (INC.)

SHARES IN PUBLIC COMPANIES
AS AT 31 DECEMBER 1973

| COMPANY | SHARES HELD | PAR VALUE | COST OF PURCHASES | APPROXIMATE MARKET VALUE AT 31/12/73 |
|---|---|---|---|---|
| Andrews & Beaven Ltd | 650 | $1 | 986.79 | 712.50 |
| N.Z. Forest Products | 616 | $1 | 1370.25 | 2388.96 |
| Golden Bay Cement | 750 | 50c | 372.31 | 717.50 |
| Wattie Industries | 841 | $1 | 781.23 | 1124.89 |
| Winstone Ltd | 750 | 50c | 372.31 | 1010.00 |
| | | | $3882.89 | $5953.85 |

NOTE I Life Members Transfer : 10% of Balance at 31/12/73.

NOTE II Royalties from Sales of Checklist.

NOTE III Stocks of *Notornis* and Valuation of Library are at Standard Values. No attempt has been made to accurately value these assets. The remaining stocks of *Biology of Birds* have been written off.

NOTE IV Shares in Public Companies cost $3883 and have an approximate market value of $5954 at 31/12/73 as listed above. During the year, shares held in Farmers Trading Co. Ltd and Alex. Harvey Industries Ltd have been sold.

NOTE V Projects Assistance Reserve:
Movement in this account during the year is as follows:

| | |
|---|---|
| Balance at 31/12/72 was | $1582 |
| Plus Royalty on Revised Field Guide | 645 |
| Balance at 31/12/73 | $2227 |

INVESTMENTS IN LOCAL BODY STOCKS
AS AT 31 DECEMBER 1973

| | | | |
|---|---|---|---|
| Waitemata County Council | $1533 | due | 17/2/74 |
| Southland Hospital Board | 900 | due | 1/11/74 |
| Auckland Electric Power Board | 400 | due | 15/10/75 |

DONATIONS 1973

The Society gratefully acknowledges the extra monies provided by the endowment members, and also the following donations exceeding $1.00 which have been received:

J. Jones $1.50; L.S. Rickard $6.00; M. Hart $2.00; J.W. St Paul $1.00 R.E. Satherly $5.00; S.R. Emmens $4.00; Mrs L. Collingwood $1.00; E. St Paul $2.00; A.E. Bond $1.00; R.J. Pierce $1.00; N. Walsh $1.00 Dr G.I. Nicholson $2.00; P.H. Dale $1.00; W.T. Poppelwell $1.00; R.N. Cotter $1.00; G.I. Hunt $1.00; P. Warren $1.00; M.D. Sibley $1; R.G. Mueller $6.00; J. Kelly $1.00; P. Kelly $1.00; Mr & Mrs H.K. Jukes $1.00; Mrs G. Dudley $21.00; Mrs H.F. Drake $1.00; Miss E. MacLean $2.00; G. Wightman $1.00; Dr A.J. Baker $10.00; M. Keillor $1.00.

# REPORT OF THE NEST RECORD SCHEME
## For the Year Ended 30 April, 1974

A total of 402 nest record cards was received from 22 contributors. Observations were made for 54 species, including the following which appeared in the Scheme for the first time: Chatham Island Petrel, White-winged Black Tern. Chatham Island Red-fronted Parakeet and the Chatham Island Warbler. There are now 10,555 nest record cards covering 140 species within the Scheme.

Hugh Robertson of Palmerston North has again provided a substantial contribution to the Scheme with 114 cards of 17 species. This is more than one quarter of the cards received this year. Notable contributions were also received from W. J. Campbell, J. Cockrem, R. S. Cowan, G. Watola and Mrs P. G. Smith.

I take this opportunity of thanking the Regional Representatives for the encouragement given to their local members which resulted in a substantial contribution this year. Thanks go to my wife whose assistance with the Nest Record Scheme has again been extremely valuable.

D. E. CROCKETT, Nest Records Convener

SPECIES FROM WHICH NEST RECORDS HAVE BEEN RECEIVED

| | Previous Total | Total 1973/74 | New Total |
|---|---|---|---|
| N.I. Kiwi | 3 | - | 3 |
| Stewart Island Kiwi | 4 | - | 4 |
| Great Spotted Kiwi | 1 | - | 1 |
| Yellow Eyed Penguin | 11 | - | 11 |
| L.B. Penguin | 65 | 11 | 76 |
| N.Z. Crested Penguin | 2 | - | 2 |
| White Flippered Penguin | 12 | - | 12 |
| Rock Hopper Penguin | 1 | - | 1 |
| N.Z. Crested Grebe | 3 | - | 3 |
| N.Z. Dabchick | 1 | - | 1 |
| Wandering Albatross | 11 | - | 11 |
| Black Browed Mollymawk | 1 | - | 1 |
| Grey Headed Mollymawk | 1 | - | 1 |
| Light Mantled Sooty Albatross | 6 | - | 6 |
| Giant Petrel | 4 | - | 4 |
| Fairy Prion | 16 | - | 16 |
| Fleshy Footed Shearwater | 1 | - | 1 |
| Sooty Shearwater | 4 | 1 | 5 |
| Fluttering Shearwater | 7 | - | 7 |
| Allied Shearwater | 3 | - | 3 |
| Black Petrel | 1 | - | 1 |
| Grey Faced Petrel | 1 | 1 | 2 |
| Kermadec Petrel | 14 | - | 14 |
| Chatham Island Petrel | - | 1 | 1 |
| Pycrofts Petrel | 5 | - | 5 |
| White Faced Storm Petrel | 5 | 3 | 8 |
| Diving Petrel | 51 | 1 | 52 |
| Gannet | 4 | - | 4 |
| Black Shag | 73 | - | 73 |
| Pied Shag | 21 | - | 21 |
| Little Black Shag | 1 | - | 1 |
| White Throated Shag | 30 | - | 30 |
| King Shag | 18 | - | 18 |
| Chatham Islands Shag | 2 | - | 2 |
| Spotted Shag | 5 | - | 5 |
| Pitt Island Shag | 3 | - | 3 |
| Blue Heron | 37 | - | 37 |
| White Faced Heron | 16 | 3 | 19 |
| Bittern | 2 | - | 2 |
| Canada Goose | 25 | 2 | 27 |
| Domestic Goose | 2 | - | 2 |
| Mute Swan | 9 | - | 9 |
| Black Swan | 62 | 1 | 63 |
| Paradise Duck | 7 | - | 7 |
| Grey Teal | 9 | - | 9 |
| Brown Teal | 2 | - | 2 |
| Blue Duck | 1 | - | 1 |
| Grey Duck | 9 | 1 | 10 |
| Grey Mallard Cross | 3 | 2 | 5 |
| Mallard | 79 | - | 79 |
| Shoveller | 16 | - | 16 |
| Black Teal | 7 | - | 7 |

| | Previous Total | Total 1973/74 | New Total |
|---|---|---|---|
| Harrier | 65 | - | 65 |
| N.Z. Falcon | 7 | - | 7 |
| Pheasant | 20 | 3 | 23 |
| Brown Quail | 5 | - | 5 |
| Californian Quail | 22 | 2 | 24 |
| Chukor | 2 | - | 2 |
| Banded Rail | 4 | - | 4 |
| Spotless Crake | 8 | - | 8 |
| N.I. Weka | 6 | 1 | 7 |
| S.I. Weka | 8 | - | 8 |
| Pukeko | 162 | 9 | 171 |
| Aust. Coot | 14 | 2 | 16 |
| S.I.P.O. - South Island Pied Oyster-catchers | 117 | 2 | 119 |
| N.I.P.O. - North Island Pied Oyster-catchers | 45 | 1 | 46 |
| C.I.P.O. - Chatham Island " " | 7 | 2 | 9 |
| Black Oystercatchers | 49 | - | 49 |
| Spur Winged Plover | 34 | - | 34 |
| Banded Dotterel | 279 | 4 | 283 |
| N.Z. Dotterel | 68 | 10 | 78 |
| Black Fronted Dotterel | 8 | 2 | 10 |
| Shore Plover | 10 | 2 | 12 |
| Wrybilled Plover | 12 | 1 | 13 |
| Chatham Island Snipe | 1 | - | 1 |
| Pied Stilt | 316 | 13 | 329 |
| Black Stilt | 7 | 1 | 8 |
| Southern Skua | 45 | - | 45 |
| Black Backed Gull | 455 | 6 | 461 |
| Red Billed Gull | 118 | 13 | 131 |
| Black Fronted Tern | 222 | 2 | 224 |
| Caspian Tern | 65 | 5 | 70 |
| Black Billed Gull | 133 | - | 133 |
| Antarctic Tern | 3 | - | 3 |
| Fairy Tern | 11 | - | 11 |
| White Fronted Tern | 68 | 5 | 73 |
| White Tern | 1 | - | 1 |
| White Winged Black Tern | - | 1 | 1 |
| Grey Ternlet | 5 | - | 5 |
| N.Z. Pigeon | 31 | - | 31 |
| Rock Pigeon | 68 | - | 68 |
| Kaka | 10 | - | 10 |
| Kea | 63 | - | 63 |
| Chatham Is. R.F. Parrakeet | - | 1 | 1 |
| N.Z. Red Crowned Parrakeet | 8 | - | 8 |
| Yellow Crowned Parrakeet | - | - | - |
| Shining Cuckoo | 9 | - | 9 |
| Long Tailed Cuckoo | 1 | - | 1 |
| Morepork | 12 | 1 | 13 |
| Little Owl | 16 | - | 16 |
| Kingfisher | 73 | 1 | 74 |
| S.I. Rifleman | 129 | - | 129 |
| N.I. Rifleman | 6 | - | 6 |
| Rock Wren | 13 | - | 13 |

| | Previous Total | Total 1973/74 | New Total |
|---|---|---|---|
| Skylark | 131 | 2 | 133 |
| Welcome Swallow | 268 | - | 268 |
| Fantail | 160 | - | 160 |
| N.I. Fantail | 60 | 4 | 64 |
| N.I. Tomtit | 26 | - | 26 |
| S.I. Tomtit | 38 | 2 | 40 |
| Chatham Is. Tomtit | 1 | - | 1 |
| N.I. Robin | 9 | - | 9 |
| S.I. Robin | 29 | - | 29 |
| N.I. Fernbird | 13 | 1 | 14 |
| S.I. Fernbird | 13 | - | 13 |
| Stewart Island Fernbird | 1 | - | 1 |
| Brown Creeper | 7 | - | 7 |
| White Head | 12 | - | 12 |
| Yellow Head | 17 | - | 17 |
| Grey Warbler | 135 | 3 | 138 |
| Chatham Island Warbler | - | 1 | 1 |
| Song Thrush | 1558 | 83 | 1641 |
| Blackbird | 1315 | 75 | 1390 |
| Hedge Sparrow | 189 | - | 189 |
| N.Z. Pipit | 69 | - | 69 |
| Bellbird | 28 | - | 28 |
| Tui | 36 | 1 | 37 |
| White Eye | 205 | 12 | 217 |
| Greenfinch | 150 | - | 150 |
| Goldfinch | 599 | 3 | 602 |
| Redpoll | 79 | - | 79 |
| Chaffinch | 250 | 13 | 263 |
| Yellow Hammer | 52 | 5 | 57 |
| Cirl Bunting | 4 | - | 4 |
| House Sparrow | 553 | 5 | 558 |
| Starling | 371 | 50 | 421 |
| Myna | 26 | 1 | 27 |
| W.B. Magpie | 31 | 3 | 34 |
| Magpie Species | 7 | - | 7 |
| N.I. Saddleback | 7 | - | 7 |

## LIBRARY REPORT

During the year there have been many requests for interloan exchanges to libraries and to members. Back numbers of *Notornis* have been ordered and despatched. The usual journals and separates have been received and duly dealt with.

HETTY McKENZIE, Hon. Librarian

★

## OSNZ RECORDING SCHEME

### Report for 1973/74

Since publication of Classified Summarised Notes, new series, the number of requests for Species files has diminished. However in 1973/74 there have been requests from seven members for information on 11 species. The files of the Scheme continue to provide a useful depository for species lists, census figures and other material which are available for study on request. It would be appreciated if members could send their notes to me as soon as possible as their compilation is a time-consuming task, and I would appreciate having it completed before the Canberra congress in August.

A. T. EDGAR, Recording Scheme Convener

★

## CARD COMMITTEE REPORT

The 1973 Christmas card depicted the Pied Tit by Miss L. A. Daff in *Forest Inhabiting Birds* published by the Royal Forest and Bird Protection Society. This was chosen to mark that Society's 50th Jubilee.

35,000 cards were sold, yielding a net profit of $1,500. The individual mailing of brochures appeared to produce a much wider response, which together with reduced postal charges helped to compensate for increased printing costs.

In 1974 we will be dropping the historical series and will be giving a choice of four original paintings by Mrs Janet Marshall — Robin, Stitchbird, Rifleman and Falcon — plus mixed packages, including the past historical series.

On behalf of the Society I would like to thank the Royal Forest and Bird Protection Society for use of the painting and for addressing the brochures. I would also thank some Wellington members for helping package brochures and cards and Miss Harper of Kaikoura for her regular annual donation. Finally I would like to thank my wife, who again had to look after despatching orders during my absence in the field.

B. D. BELL, Convener

# BIRD DISTRIBUTION MAPPING SCHEME

## Annual Report for 1973

This report, the fifth in the series, is less detailed than usual because the record cards can no longer be sorted manually, and the computer tabulations have still to be checked. Nevertheless, a useful indication of progress is provided by the number of species lists received during the year and by the increase in the percentage of squares that have lists.

### PROGRESS TOWARDS NATIONAL COVERAGE

Approximately 1900 species lists made during 1973 were received up to 26 March 1974. Other lists, compiled before 1973, reached the office too late for inclusion in last year's report (*Notornis 20:* 159-165, June 1973). Hopefully, there will be some more late cards to swell the 1973 total. The number of people who have contributed to the scheme since it began now stands at 404.

The squares shaded black in Figs. 1 and 2 are those from which one or more lists had been received by 26 March 1974. At that time, lists were available from 87% of the 1600 North Island squares (70% in December 1972) and from 76% of the 2000 South Island ones (59% in December 1972). Further work is needed to cover the many blank squares (left white in the accompanying maps) in several rather inaccessible areas along the main axial ranges of both islands. In the North Island, important gaps remain between the northern Ruahines and the Raukumaras and, in the South Island, further surveys are especially needed in north-west Nelson, in inland areas of Westland, Canterbury and Otago, and in south Westland and Fiordland.

### PROCESSING THE DATA

All lists have now been coded for the computer and some preliminary tabulations are already to hand. Much checking and correcting, and development of computer programmes, are necessary before the data can be fully used. Nevertheless we hope that within a couple of months, we can again supply Regional Representatives with lists of species and other information which, regrettably, we were unable to provide while the cards were away being coded. Further work is needed before accurate maps of distribution can be printed by computer, but some recent trial prints were shown at the Society's Annual General Meeting.

### THE FUTURE

Assuming a further substantial increase in both lists and coverage this coming season, the scheme's accumulated records to the end of 1974 should provide a useful baseline for detecting future changes in the distribution of common birds. While more years of intensive work would certainly yield longer lists for many squares, the interpre-

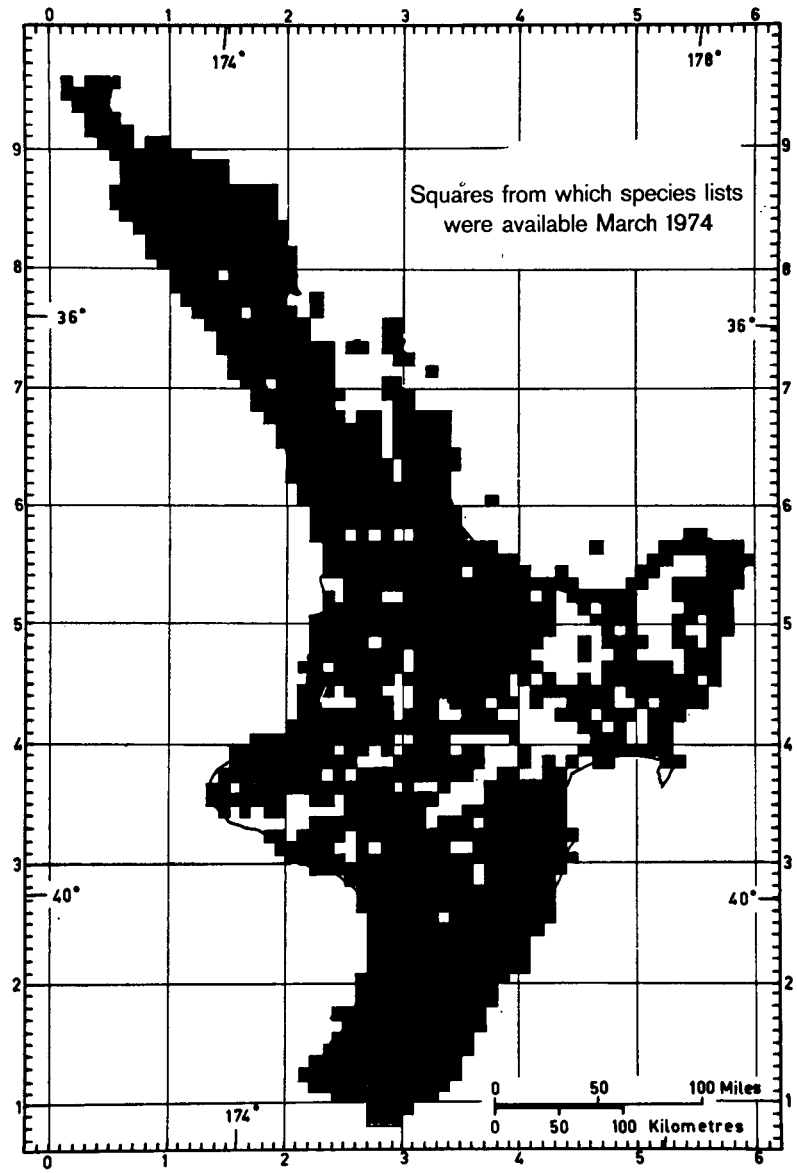


FIGURE 1 — Coverage in the North Island; the white areas are those from which no bird list has yet been received.

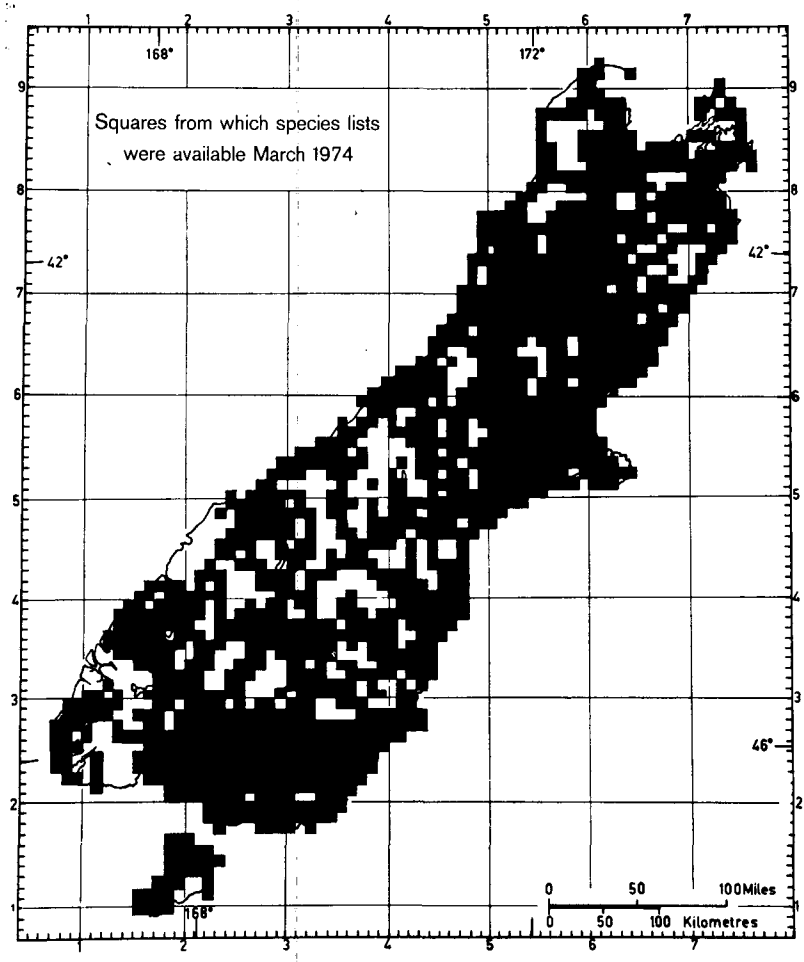


FIGURE 2 — Coverage in the South Island; the white areas are those from which no bird list has yet been received.

tation of the lists would be complicated by the longer time period involved. Further, the hard work and enthusiasm members have devoted to bird mapping since 1969 cannot be expected to continue indefinitely, and lots of hard work and enthusiasm will be needed to repeat the observations some years hence when there has been time for changes in distribution to occur.

For these reasons, the high priority given to the Bird Mapping Scheme by Council over recent years will be relaxed somewhat as from the end of 1974. Emphatically, this does not mean that the scheme is to be ended; rather the intention is to allow a rest period

in preparation for renewed efforts in a few year's time. As 1974 will be the last opportunity to ensure that the five-year pool of data provides a really good baseline for future comparisons, members are urged to make a special effort this year to compile species lists from new squares and from new habitats in squares already covered. Members who wish to continue making species lists after 1974 are of course welcome to do so, and all lists (but especially those from remote areas, new squares or new habitats) will be gladly received. The scheme's office will remain in being; it will devote special attention to methods of handling the present data and to planning the next phase of field work which will involve metric squares.

ACKNOWLEDGEMENTS

The authors wish to thank the many members of the Society who have compiled species lists during the year, and the Regional Representatives for their work in distributing and checking cards and in arranging field trips for bird mapping purposes. We are grateful to the Cartographic Section of DSIR for preparing Figs. 1 and 2, and to Dr J. A. Gibb (Director, Ecology Division DSIR) for permission to use official time and facilities in servicing the scheme. The major progress during the year has been the provision of computing services made possible through the good offices of Dr G. R. Williams (Head, Wildlife Service, Department of Internal Affairs) and the work of Mr C. J. R. Robertson (also of Wildlife Service) and officers of the Government Computer Centre in planning the coding and programming of data.

P. C. BULL
P. D. GAZE

*Ecology Division, DSIR,*
*P.O. Box 30466*
*Lower Hutt*

# SHORT NOTES

## SIGHTING OF BULLER'S SHEARWATERS IN FIJIAN AND TONGAN WATERS

During May 1972, when I was on passage from Suva to Niue Island aboard m.v. *Waimea,* Buller's Shearwaters *(Puffinus bulleri)* were sighted on two successive days.

*a.* 22 May 1972, position 18°30'S 178°13'W, vessel some 15 miles to the east of the Lau Group, Fiji. One large shearwater, flying in long glides with occasional wing beats close to the sea surface, was seen near the ship. Upperparts appeared grey-brown with a distinctive dark 'flattened M' across the wings and back. Tail, crown and nape and bill also appeared dark. Underparts including underwing were all white.

*b.* 23 May 1972, position 18°39'S 173°16'W, 40 miles east of 'Uta Vava'u, Tonga. Three Buller's Shearwaters were seen at close quarters and positively identified. These birds were flying north close to the sea surface. In addition two more large shearwaters, dark upperparts and white below were seen flying north but were too far away for positive identification as Bullers.

So far as I can determine from the available literature (cf. Jenkins 1967, 1973) there have been no previous sight records in the Fijian and Tongan areas. The major migration route through the tropics has not yet been discovered (King 1967).

### REFERENCES

JENKINS, J. A. F. 1967. Unusual records of birds at sea. Notornis XIV (3): 153.

JENKINS, J. A. F. 1973. Seabird observations around the Kingdom of Tonga. Notornis XX (2): 113-119.

KING, W. B. 1967. Seabirds of the Tropical Pacific Ocean, Preliminary Smithsonian Identification Manual. Pp. xxxii + 1-126, pls 1-11. Washington D.C.: Smithsonian Institution.

NEIL CHESHIRE

*180 Glamorgan Drive,*
*Torbay,*
*Auckland*
*and m.v. "Athol Viscount"*
*c/o Union Steam Ship Co. of N.Z. Ltd.*
*Quay Street*
*Auckland*

## SIGHTING OF ANTARCTIC FULMAR WEST OF NEW ZEALAND

On 24 August 1973 a light coloured bird in the company of 20+ Cape Pigeons *(Daption capensis)* was observed from the bridge of m.v. *Waimea.* The vessel's position was 38°50'S, 168°26'E, some 250 miles west of Cape Egmont, the weather fine, calm and clear. The bird was somewhat larger than the Cape Pigeons and, with close observation at a distance of some fifty feet, the following characteristics were noticed. Fairly heavy pinkish bill, white underparts and a very pale back, rump and upperwing. The primaries appeared alternately black and pale grey giving an overall effect of black fingering. It was identified as an Antarctic Fulmar *(Fulmarus glacialoides).*

PETER NESFIELD

*8 Opua Street,*
*Belmont,*
*Auckland 9*
*and*
*m.v. "Ngakuta,"*
*c/o Union Steam Ship Co. of NZ Ltd,*
*Quay St,*
*Auckland*

★

## KERGUELEN AND ANTARCTIC PETRELS ON A SOUTHLAND BEACH

On 13 October 1973, with my daughter Kate, I did my usual monthly beach patrol of three miles of Oreti Beach, Southland, from Waimatuku Mouth to the North Entrance. There were two specimens which I was unable to identify on the spot. Later in the day I took the specimens to Mr Roger Sutton. Using New Zealand Birds (Oliver 1955: 161-162), we identified one as a Kerguelen Petrel *(Pterodroma brevirostris).*

The other bird was in very poor condition. The skull and bill were there, a few primaries of one wing, the skeleton, some abdominal and under-tail coverts, and the tail. It was full of maggots and highly pungent. The plumage was impregnated with sand and any attempt to shake this out dislodged feathers. The bird was about seventeen inches long, wing 297 mm, petrel bill 52 mm, and tarsus 46 mm. Under-plumage was white, and the tail white with a terminal band of brownish-black. By referring to *A Field Guide to Australian Birds* (Slater *et al.* 1970) we provisionally identified the specimen as an Antarctic Petrel *(Thalassoica antarctica)).*

The *Annotated Checklist* (OSNZ 1970) states that the species is common in the Ross Sea, moves north with the pack ice in winter, but rarely ranges north of 60°S. Slater (1970: 7) mentions a record in 1965 at Macquarie Island.

Both birds were sent to Mr F. C. Kinsky at the National Museum of New Zealand, who confirmed the identifications.

It is significant that these birds were found at the same time as the small wreck of Antarctic Fulmars *(Fulmarus glacialoides)* by Mr Les Henderson.

## LITERATURE CITED

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OSNZ 1970. Annotated checklist of the birds of New Zealand . . . (The Checklist Committee, F. C. Kinsky, Convener), Ornithological Society of N.Z., Inc. Pp. 1-96. Wellington, *&c.:* A. H. & A. W. Reed.

SLATER, P. *et al.* 1970. A field guide to Australian birds. Non-Passerines. Pp. xxxii + 1-428, text illus., pls 1-64, 396 maps. Adelaide, *&c.:* Rigby Ltd.

MAIDA BARLOW

*152 Lewis Street,*
*Invercargill*

★

## FANTAIL RE-USING A TILTED NEST

At Belmont, Lower Hutt, a Fantail *(Rhipidura fuliginosa)* nested 3 m up on a long, slender branch of a mahoe *(Melicytus ramiflorous)*. The nest, with two eggs on 20 October 1973, proved too heavy and bent over the twig it was built on. The photograph (Fig. 1a) was taken on 4 November, and both eggs were found broken below the tilted nest a day or two later. The bird(s) re-levelled the nest by adding material to the rim at one side (Fig. 1b), and it contained four eggs on 10 November. Three chicks fledged on 10 December, the day after the second photograph was taken.

Fantails may build six or seven nests in a season (Philpott 1919, Blackburn 1965), but " the second use of a nest is quite exceptional " (Blackburn 1966), although also recorded by Coates (1966). The nest is usually on a slender horizontal fork, so engineering it to be level when completed must be a normal skill. (The asymetry of the first nest appears to compensate for a 15° dip in the twig during construction, but the sag continued for another 15°.) It is interesting that this pair bothered to re-level a marginal site rather than build afresh, and re-laid so soon after losing the first clutch.

## REFERENCES

BLACKBURN, A. 1965. Breeding of the North Island Fantail. Notornis 12 (3): 127-137.

——— 1966. Some further observations on the nesting of the North Island Fantail. Notornis 13 (4): 189-196.

COATES, N. F. 1966. Nesting report on a pair of South Island Pied Fantails. Notornis 13 (4): 197-198.

PHILPOTT, A. 1919. Notes on the birds of south-western Otago. Transactions and Proceedings of the New Zealand Institute 51: 216-224.

JOHN E. C. FLUX

*Ecology Division,*
*DSIR,*
*Lower Hutt*

FIGURE 1a — Fantail *(Rhipidura fuliginosa)* incubating two eggs in tilted nest, 4 November 1973.

FIGURE 1b — Feeding three chicks in re-levelled nest, 9 December 1973. Note new material on left edge, and the distorted " tail " of the nest.

# OBITUARY

## RAY JACOBS, M.B.E. — AN APPRECIATION

Few people in New Zealand have given so much pleasure to so many others in the portrayal of birds and their habitats than the late Mr R. J. Jacobs who died in Christchurch on 20 February 1974. The galleries of the Canterbury Museum testify to the talents of a man whose memorial they will continue to be. Whether it be in the Edgar Stead Hall of Birds, the reconstructed streets and shops of colonial Christchurch, the dioramas of whaling in the Southern Ocean and the gold towns of the West Coast, or just the simple but effective backdrops to the Oldman collection of Polynesian artifacts, the skill of Ray Jacobs, lately retired as Senior Preparator of the Canterbury Museum, reveals itself to the visitor at every hand. The Spotted Shags of Bank's Peninsula, the terns on the beach at Okarito, the keas at Arthur's Pass, these, my favourite groups, and others I watched in the making during the years I have enjoyed the friendship and inspiration which one gained from knowing Ray Jacobs. He was above all a modest man but his work will continue to tell of him. In the 1974 New Year's Honours List, issued shortly before his death, Mr Jacobs was created a Member of the Most Excellent Order of the British Empire and was invested at his bedside by the Governor-General. This was a recognition not only of his own contributions to ornithology by way of museum techniques but of the significant role of the museum preparator in popular education. But let others who worked more closely with him pay their particular tributes to a quiet and unassuming worker.

E. W. D.

To be a trained taxidermist, a skilled preparator, and an artist at home in the expansive requirements of a mural, is a combination of talents rarely found in one person, but Ray Jacobs was such a one.

With taxidermy as a family tradition he had no need to learn from books. Fidelity to nature was a first requirement and it is doubtful if he ever turned out a specimen that was less than perfect within the limits of the art. When display required accessories he had the modelling skills needed to get exactly what the display required. The biggest challenge of all as he saw it was to ensure that his finished display, whatever the scale, was a mirror of nature, capturing both the mood of the wildlife depicted and the atmosphere of the natural habitat. This meant long hours in the field observing, and a balanced assessment of what was needed and what was possible in a static display. The completion of the many outstanding groups in the New Zealand bird hall of the Canterbury Museum is a tribute not only to his skill, but also to personal qualities of temperament and character. It was a privilege to be associated with Ray Jacobs as a colleague. He was patient with people as well as with his refractory materials,

and gentle in the best sense of the term. One of his most refreshing traits was modesty, and the tributes that are now paid to his distinguished professional career are something that he would not have thought of claiming for himself.

R. A. F.

Ray Jacobs will long be remembered not merely as an outstanding museum display artist and taxidermist, but as one of those few who have been able to incorporate a feeling of their enthusiasm, understanding and sympathy for wildlife into static museum displays. The habitat groups at the Canterbury Museum will long stand as a memorial to this outstanding gift.

R. R. F.

Ray Jacobs was one of the finest taxidermists and display artists that New Zealand has produced, and his long association with Canterbury Museum provided many opportunities for him to show his skill.

Perhaps the most spectacular example of his work is the Stead Hall of New Zealand birds, where, under the direction of Mr E. G. Turbott, he, with the co-operation of Mr Ralph Riccalton, created a display which is the admiration, not only of New Zealanders, but which has won acclaim from visitors from many lands. Ray's work will live long after him.

R. J. S.

Ray Jacobs will always be remembered for his superlative natural history dioramas, and especially for the series in the New Zealand Bird Hall of Canterbury Museum the standard of which has attracted world-wide interest; I worked on the Hall with Ray Jacobs and Ralph Riccalton and remember this as a period of productive and stimulating exchange of ideas and vigorous action. Ray had progressive views on every aspect of Museum work. Perhaps his main characteristics were his vigorous approach to even the most demanding task and his belief in the Museum as an educational and cultural force, both resulting in displays which will long be the pride of the Museum.

E. G. T.

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## Dr R. W. WILLETT, FRSNZ

We record, with great regret, the death on 6 June of Dr R. W. Willett who retired as President of the Royal Society of New Zealand in May of this year shortly after leading the first scientific delegation to visit the People's Republic of China.

Dr Willett, who was 61, was Assistant Director-General of the DSIR and formerly Director of the N.Z. Geological Survey. He was a man of action, of forthright opinion and decision, a leader in both

science and administration, and a friend and adviser to his many colleagues and fellow members of the innumerable committees on which he worked. Dr Willett was deeply concerned with the relationship of the Member Bodies of the Royal Society of N.Z. to the Society itself and its function as a unique amalgam of scientific endeavour and reasoned opinion. Although he was no ornithologist, he was genuinely appreciative of the role of the Ornithological Society of N.Z. as a Member Body of the Royal Society of N.Z. and of the contribution that ornithology as such makes to science. With his passing we have lost a friend and an advocate.

E. W. D.

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## NEWLY PUBLISHED

BAKER, A. J. 1974. Criteria for aging and sexing oystercatchers, N.Z. Journal of Marine and Freshwater Research 8 (1): 211-221, fig. 1, tables 1-4.

ABSTRACT: " Criteria based on external characters are presented for aging and sexing the three New Zealand species of oystercatcher, *Haematopus ostralegus finschi* Martens, 1897, *H. unicolor* Forster, 1844, and *H. chathamensis* Hartert, 1927. Four classes are discerned: juveniles have brown dorsal plumage, a brown iris and grey legs; second-year birds have an orange-red iris and pale pink legs; sub-adults have a dull red iris and pink legs; adults have a scarlet iris and bright coral pink legs. The three species can be sexed by discriminant analysis of the sexually dimorphic characters bill length ($x^3$), bill length: bill depth ($x^2$) and bill length: bill width ($x^3$) . . ."

SERVENTY, D. L. 1974. The biology behind the Mutton Bird industry. Papers and Proceedings of the Royal Society of Tasmania 107: 1-9, figs 1-2, table 1. (The Royal Society of Tasmania Medal Lecture 1970).

★

The January 1974 issue of *The Auk* (91 (1): 241) announces an award from the Frank M. Chapman Memorial Fund of the American Museum of Natural History to Dr John Warham for " biometric studies of the Procellariiformes " and also to Dr Joel Cracraft for a study of " evolution of the moas," the results of which will interest many of us. Dr Warham has recently published an important study entitled: " The breeding biology and behaviour of the Snares Crested Penguin. *Journal of the Royal Society of N.Z.*, 4 (1): 63-108, 17 figs, March 1974.

# LETTERS

The Editor,
Sir,

## WELCOME SWALLOW BANDING GROUP

We would be grateful if you would bring to the attention of members of the OSNZ that in Tasmania we have formed a Welcome Swallow Banding Group, which is under the aegis of the Australian Banding Scheme and is operated through the CSIRO Division of Wildlife Research. The object of this group is to find out something about their migratory movements from Tasmania to the mainland of Australia. Up till now no Tasmanian banded Welcome Swallow has been picked up on the mainland or vice versa. Having read Mr A. T. Edgar's paper in *Notornis* Vol. XIII on " Welcome Swallows in New Zealand 1958-1965," we thought that there might be a very slim chance of someone picking up a dead Tasmanian banded Welcome Swallow. But, at any rate, we would be very glad if everyone would keep an extra watch for banded Welcome Swallows, dead or alive, as the whole success of our project depends on the return of bands to CSIRO, Canberra, ACT, Australia. Thank you.

PRISCILLA PARK

(Organiser, Welcome Swallow Banding Project)

*Campania,*
*Tasmania 7202,*
*Australia.*
*23 February 1974*

★

The Editor,
Sir,

## THE WHITE-TAILED TROPIC BIRD IN THE GALAPAGOS: A MISTAKE ?

Today the Deceber 1973 issue of *Notornis* arrived and I was astonished to learn from Mr S. R. Brown's note on page 381 that the White-tailed Tropic Bird *(Phaeton lepturus)* was breeding in the Galapagos. That does not appear to be the case. I know because I was stationed there for over 15 months spread over two years, and I saw most of the tropic bird colonies (see *Condor* 1966: 95) without ever finding more than one species. In the latest list by Harris (*Condor* 1973) the text for the Tropic Bird has unfortunately been dropped by the printers, but I know from Harris that he still has only one species there.

It would be interesting to know where the observer found about *P. lepturus* in the Galapagos islands.

## REFERENCE

BROWN, S. R. 1973. First record of White-tailed Tropic bird in New Zealand. *Notornis* 20 (4): 380-1.

RAYMOND LEVEQUE

*Schweizerische Vogelwarte Sempach*
*Station ornithologique Suisse,*
*CH-6204 Sempach,*
*Switzerland*
*6 March 1974*

Mr Stan Brown writes that he obtained his information from a magazine article but is unable at the moment to recall the reference. Mr F. C. Kinsky, who identified the New Zealand specimen, comments as follows:

" M. Leveque is quite right, as there are no White-tailed Tropic Birds breeding or otherwise on the Galapagos Islands. Of *Phaeton lepturus,* 5 subspecies have been described and have been generally acknowledged.

*P. l. lepturus,* breeding on islands in the Indian Ocean;
*P. l. fulvus,* confined to Christmas Island (Indian Ocean);
*P. l. dorotheae,* Southwest Pacific islands, including Fiji, Samoa, Tonga, Niue, Nauru, Cooks and many others;
*P. l. catesbyi,* West Indies;
*P. l. ascensionis,* Ascension Island and some other islands in the Gulf of Guinea (West Africa).

Where Mr Brown obtained his information from, I do not know. He might have possibly seen some pictures of the other " white-tailed " tropic bird normally referred to as the Red-billed Tropic Bird *(P. aetherus)* which, in addition to breeding on islands in the Caribbean Sea and other islands in the tropical Atlantic, breeds on islands west of Central America including the Galapagos."

★

The Editor,
Sir,

## THE SOCIETY AND ITS CONSTITUTION

As still " another longstanding member," may I suggest to Mr J. M. Cunningham that unless we do take action, there may be no " living birds in their natural state " left to study. The original constitution of the OSNZ was admirable when first formulated, but the march of time left it outdated, as often happens with constitutions, and giving power to our officers to do something constructive, if necessary, towards conservation was an overdue measure. As I remarked at the AGM where the constitution was amended, " if we cannot trust our officers to act wisely, why bother to elect them ? "

R. J. SCARLETT

*Canterbury Museum,*
*Christchurch, 1*
*6 June 1974*

# REVIEWS

BAKER, A. J. 1974. Ecological and Behavioural evidence for the systematic status of New Zealand Oystercatchers (Charadriiformes: Haematopodidae). *Royal Ontario Museum Life Sciences Contributions* 96: 1-34, figs 1-11, tables 1-7, 1974. Can.$2.00 (obtainable from the Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, Canada M5S 2C6).

In his first two papers on New Zealand oystercatchers, Allan J. Baker discussed the distribution of all populations (Distribution and numbers of New Zealand Oystercatchers. *Notornis* 20 (2): 128-144; June 1973) and the results of a progeny study for the Variable Oystercatcher in Northland (Genetics of plumage variability in the Variable Oystercatcher *(Haematopus unicolor)*. *Notornis* 20 (4): 330-345; December 1973). The third paper in this interesting series has regrettably been published outside New Zealand (Baker 1974). It demonstrates an holistic approach to systematics which has not been used before in this country, combining 'traditional' with 'modern' taxonomic methods. In the process it describes and gives meaning to much ecological and behavioural material on our oystercatchers. Baker draws not only on the physical characters of the birds but also on habitat preferences, feeding habits and food requirements; the timing, ecology and some behaviour patterns of the breeding cycle, sound spectrographs of social piping calls and the species of internal and external parasites.

One objective pursued in all three papers is to show that the black, intermediate and pied forms, which have been variously assigned to *reischeki* and *unicolor*, all belong to a single breeding population, the species *Haematopus unicolor*, in which *no subspecies* should be distinguished. This confirms the 'informed guess' of the 1970 Checklist and allows the taxon *reischeki* of other publications to sink into taxonomic oblivion.

In the 1974 paper, Baker also examines the affinities of the Chatham Islands Oystercatcher *(H. chathamensis)* to the two mainland species. A total of twenty-three ecological and behavioural characters, which could reflect mechanisms of genetic isolation, have been used in a numerical analysis of the five oystercatcher taxa (South Island Pied Oystercatcher, pied phase Variable, intermediate phase Variable, black phase Variable and Chatham Island Oystercatcher). Three different types of multivariate analysis (cluster analysis, principal components analysis and nonmetric multidimensional scaling) have been used to combine all the characters into simple measures of how close each taxon is to the others. The groups fall in the resultant two and three dimensional graphs in biologically sensible patterns. When a coefficient which emphasised *dissimilarities* was used, the Chatham Island Oystercatcher was closest to the South Island Pied Oystercatcher, but when a *similarity* coefficient was used the Chatham bird showed greater affinity to the Variable Oystercatchers. But in each analysis used, the three major taxa (South Island Pied, Variable and

Chatham) were shown to be significantly discrete entities with all three phases of the Variable Oystercatchers lying very close together. With computer services more readily available to carry out the tedious computations of multivariate analyses, it is to be hoped that the biological sense of this work will encourage other ornithologists to use what is after all only the logical and elegant offspring of the scatter diagram.

Among the ecological material there is an instructive list of prey species taken by mainland oystercatchers; apparently they do take more species of mollusca (including pauas but not oysters) than they do of worms and crustacea. Baker also demonstrated that the long slender bill of the South Island Pied Oystercatcher gives it a strategic advantage over the Variable in habitats with soft substrates. A flock of both species was watched feeding on tuatuas *(Amphidesma subtriangulatum)* at Jackson's Bay, the two species feeding at approximately the same rate and for the same period of each tidal cycle. South Island Pied Oystercatchers were able to obtain an average daily quota of tuatuas equivalent to about 52% of their body weight but the average daily intake of the Variable birds was only about 36% of their body weight. At Kaikoura on a rocky substrate the short robust bills of the Variable birds enabled them to obtain limpets equivalent to 44% of their body weight, showing that they were more efficient at feeding on rocky substates than on soft ones. In terms of niche utilization their choice of the rocky substrate has distinct survival value, particularly in districts with large flocks of South Island Pied Oystercatchers. Baker gives only a brief resume of this experiment and a more detailed account of the problems involved in this type of assessment would be valuable. He gives a general formula for the computation of the existence metabolism for a South Island Pied Oystercatcher of average weight which suggests that the bird would require 64.69 Kcal/bird-day to maintain body weight in captivity. From Baker's figures it would appear that the Jackson Bay birds were obtaining about 1090 Kcal/bird-day, a discrepancy of considerable interest.

It is to be hoped that many New Zealand ornithologists will seek out copies of this useful and stimulating paper.

J. H.

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McPHERSON, L. B. *Sounds of New Zealand Birds, Vol. 5.* A 45 r.p.m. extended play record, PR 739. Christchurch: McPherson Natural History Unit, P.O. Box 21-083, Edgeware, 1974. $1.50 plus postage.

Les McPherson's Natural History Unit has produced the fifth volume in this series. Birds recorded are:

| SIDE ONE | SIDE TWO |
|---|---|
| North Island Weka | Kea |
| Red-fronted Parakeet | Pukeko |
| North Island Kaka | Fairy Prion |
| Northern Blue Penguin | Indian Myna |
| Morepork | Australasian Gannets |

These were not recorded by Mr McPherson but by Carl and Lise Wiesmann on their trip here in 1956-7 using EMI L2a and L2bs recorders on Scotch 11A and 12 tapes with a 36" parabolic reflector.

I have found nothing to fault the technical quality of these recordings, and believe most listeners will agree that they represent very well the general types of communications of these species.

These are loud, low-voiced birds which are among the easiest to record. That is to say, they do not have strong high notes with great volume such as is found with the New Zealand Robin, the Hedge Sparrow, and those of similar eloquence but which are the bane of every recordist, even those blessed with the possession of such high-fidelity, precision machines as the Swiss Nagra with its speed of 15" per second. As mentioned in previous reviews, it is most difficult to prevent over-recording, with consequent distortion, in making tapes of such birds. This problem did not exist with the birds on this disc. Nevertheless, it is most evident that care and experience combined to produce some very excellent tapes. Our appreciation and commendation go to the Weismann husband-wife team and to Mr McPherson for making this disc available to the public.

Wm. V. W.

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*The Natural History of New Zealand. An ecological survey.* Edited by Gordon R. Williams. Pp. XVIII + 1-434, text illus., pls 1-40. Wellington, *&c.:* A. H. & A. W. Reed. 1973. $15.50.

Only a brave man (of incredible omniscience) or a rather foolish one (possessed of crass ignorance) would try to review such a comprehensive book as this purports to be with equal profundity for all parts of it. The accepted technique for the reviewer is to sample a part and, finding what is new and true, authentic, questionable, or however it seems in the particular field of knowledge which the reviewer professes, judges then the whole by the part. I have been pleased, therefore, to find many things not said before, some things said by others but not in this way with yet other things known to most of us but gathered together or reinterpreted here in a manner which makes *The Natural History of New Zealand* a unique reference work.

I cross swords, therefore, with the reviewer of *The Press*, the Christchurch morning paper, who wrote of this book on 11 May 1974:

> " The editor claims that the book is an ecological survey, hoping that today's " man in the street " might find it a basic reference on which he may base his judgement of his impact on, and his development of, the New Zealand environment. But time also passes for the scientists and most of the facts and ideas seem to predate 1971.
>
> " Some of today's real problems, for instance water management in swamps and estuaries, are hardly mentioned, and for the most part the general movement of concern about our environment has already assimilated most of the ideas behind the book.

> " It is unfortunate and disappointing that the book presents no great advance over a combination of " The Natural History of Canterbury " and " Encyclopedia of New Zealand." For the general reader it may be a useful summary up to 1970 of the state of natural history in New Zealand."

One would be sorry to think that the potential user, the " man in the street " if you wish, wanting to know the " state of the art " of the natural history of New Zealand, the high school or university student, the teacher, the university lecturer, all or any of these, would be turned away from this rich source of knowledge which he certainly will not be able to find between two covers anywhere else. To label such a reference work as out of date is trite. Of course it must be — as those who know the inevitable delay between the time a manuscript leaves its writer's hands and the appearance of the printed page can testify — but can any publisher present science at work with any greater expediency ? The reader of papers in even a quarterly journal knows how long it is since the work was done and the hypotheses proposed. Even letters to *Nature* hardly reveal the advancing forefront of knowledge.

Admittedly *The Natural History of New Zealand* does not look a pretentious volume. But the meat is there even if the wrappings of the sandwich do not suggest it. The somewhat garish dust jacket with its 16 vignettes of New Zealand natural history is not especially attractive and the impression given by the 434 pages of quasi-newsprint is immediately that what is printed on them must therefore be of similar quality. The cost of the book, already high enough, would be much greater, the publishers might argue, if the binding, paper and wrappers were to match the worth of the contents but it might have been a risk worth taking. As it stands, it reflects little on the publisher's art or on the House of Reed in particular.

*The Natural History of New Zealand* is made up of the following contributions — The General Environment and New Zealand's Biogeography (G. Ross Cochrane), 27 pp.; Ecological Aspects of the Climate (J. D. Coulter), 33 pp.; The Ocean Environment (J. W. Brodie), 32 pp.; The Sea-shore (J. E. Morton), 38 pp.; Soil Ecology (J. D. Stout), 24 pp.; Native Vegetation (P. Warle), 15 pp.; Introduced Vegetation (A. J. Healy), 20 pp.; Insects (A. D. Lowe), 14 pp.; Agricultural Ecology (A. G. Campbell), 15 pp.;The Freshwater Environment (V. M. Stout), 22 pp.; Fish and the Fisheries (G. D. Waugh), 33 pp.; Reptiles and Amphibians (Joan Robb), 19 pp.; Birds (G. R. Williams), 30 pp.; Mammals (J. A. Gibb & J. E. C. Flux), 38 pp.; Offshore and outlying Islands (I. A. E. Atkinson & B. D. Bell), 21 pp.; Nature Conservation (J. T. Salmon), 18 pp.

One would begin by agreeing with the critic in *The Press* that the first contribution is poor. We have come to expect a high standard from those who have already outlined the general ecological situation and biogeography of New Zealand and this reviewer, for one, would have liked to have seen what the editor himself, a recognised and respected practitioner of the masterly summary and compilation, would have said on these topics. The " biogeography " is a rather muddled mixture of biotic factors, affinities, problems of dispersal and grouping of compositions of flora and fauna taken from C. A. Fleming's accounts

and giving the impression of not being quite understood by the author himself. The climatology and geology have been better dealt with elsewhere including Coulter's contribution in the same volume and in the various geological articles in the *Encyclopaedia of New Zealand.* Coulter's article is very much better and does a worthwhile job in that it shows us what those rather stodgy Monthly Climatological Summaries and Annual Meteorological Observations produced by the N.Z. Meteorological Service can mean in terms of ecology and the features of the environment and its various inhabitants which interest us. Topics dealt with here include various aspects of the macro-climate, local climates, mountain climates and micro-climates, climate related to natural communities, climate in agriculture (which ties in nicely with A. G. Campbell's later article in this volume) and a summary of problems, many of an ad-hoc nature, which occupy the meteorologist including aerobiology, concerning the mechanism of transportation of organisms across the Tasman, an aspect recently discussed elsewhere for insects but scarcely adequately investigated for birds. The ornithologist is only lately beginning to realise the usefulness of meteorological information (cf. Hamel 1972, *Notornis* 19: 20-25; Barlow & Sutton 1972, *Notornis* 19: 212-249) and the extensive documentation and notes given by Coulter provide a most helpful introduction to a science often little appreciated by those working in other disciplines.

For the ornithologist many of the other chapters will be very relevant, some more than they realise at present. For example, a particularly fine attempt at a correlation of seabird distribution with physical factors of the sea which is currently appearing in *Notornis* uses a great many references to published work on the physical oceanography of New Zealand all done by the staff of the N.Z. Oceanographic Institute (i.e. within the past 20 years or less), marking, incidentally, the special contribution that this division of the DSIR has made to New Zealand science, but showing in particular the relevance of such information to an ornithological problem. J. W. Brodie's contribution on " The ocean environment " will be a source of reference to those who want to know where to find details of the physical properties of the seas around New Zealand as well as the more specialised aspects of marine ecology and productivity. The history of marine exploration in New Zealand makes fascinating reading and it will be a revelation to many readers to see how much background information now exists applicable to the practical problems of fishery and mineral exploitation. To show how wrong the *Press* reviewer is, we find that Brodie's contribution lists a score of as yet unpublished manuscripts or papers " in press " and cites the very latest works in both physical and biological oceanography. It could hardly be more " up to date " (particularly since some of the items cited are *still* " in press ").

I am not going to be brave or foolish and pass comment on the other allied contributions except to remark that, in a similar way, the chapters on native and introduced vegetation by Wardle and by Healy give a handy summary of much that is relevant to the ornithologist and, since they are written by people acknowledged to know what they are about, they are likely to be both true and useful to the non-

botanist. Insects, agriculture, the freshwater scene, reptiles and amphibians, mammals (the length of this chapter illustrating the significance and importance of an element of the fauna introduced from outside New Zealand) — all these are welcome scholarly and readable contributions, the study of which will broaden the interests of us all and deepen our appreciation of the particularly varied environment in which we (as introduced mammals ourselves) inhabit. The chapter on offshore and outlying islands, written by two authors who know their islands and their problems, is especially interesting providing the backdrop to many of the studies which we read of the conservation work of the Wildlife Branch and the mammal/plant/bird research of the Ecology Division of the DSIR.

The chapter which concerns us most is, of course, that on " Birds " by Gordon Williams, editor of the whole work. An admirably condensed introduction is given to the history of the New Zealand bird fauna, what has come, whence they came and when, much of this admittedly following Fleming but none the less welcome for its integration here. A tabular analysis of the composition of the recent avifauna based on the OSNZ 1970 Checklist is shown together with a novel " environmental distribution." A summary of migration, both external and internal, follows. An important section now comes — " Changes in the avifauna in European times." The much argued relationship between introduction of predatory mammals and the vulnerability of birds that have evolved in the absence of carnivorous mammals is examined all too briefly for this author seems to reach less sweeping conclusions than others reach notably Gibb & Flux in this same volume even though they restrain Fleming's belief that native rats may have killed Moas.

Dr Williams devotes five of his pages to a history of bird study in New Zealand which would have been good to have included in the recent special issue of *The Emu*. Some living ornithologists have been lauded but it is difficult, if not invidious, to give credit where it is due especially in a field of study where so many genuine amateurs have made notable contributions. There is particular interest in Dr Williams' discussion of the attention paid to rare species notably in the attempts that have been made to discover general principles or " understanding better what has been going on in New Zealand." New maps of the distribution of the kiwis in relation to forest areas and of the Huia are shown. Some evidence of the basic philosophy of the field and captivity studies by the Wildlife Branch is evident in Dr Williams' hopes — " As a result of the study of the extinction — or reduction — patterns of various species, there is a chance that a common pattern in time, space, or both may emerge . . . When these and other similarities (or differences) are analysed in detail it may be possible to understand some of the changes in the avifauna that have occurred over the last 200 or more years."

The avifauna of offshore and outlying islands is discussed and Dr Williams' table of endemic breeding species of these islands will be found useful to read in conjunction with Atkinson & Bell's review in the same volume. A short section on " Disease " is welcome since this is a topic not well known about by the average bird man in New Zealand but one that might play or have played as equally an

important part as predation in the reduction of species both endemic and introduced. More might have been said about " environmental factors " where Dr Williams writes briefly of climatic accidents, altitude and species composition and correlations of the occurrence of species and their abundance with vegetation types, the latter topic being of particular relevance to the current Beech/Pine controversy. As Dr Williams notes — " The common conclusion is that food is the prime determiner of both numbers and distribution." An " ecological survey," as the book says it is, should really have developed these themes further but the lack of this may be rather a reflection on the slender state of knowledge of such a vital aspect of our avifauna and one that will continue to hang a question mark over the whole of the Forest Service's well-intentioned management of beech forests. Population studies, a pet theme of the author's, are well summarised but again show that there is much to do. " Birds as pests " and " Food habit studies " reveal more of the work of Ecology Division and the Wildlife Service. Ethology is shown to be a neglected aspect of ornithology in New Zealand and one that even direct copying of what has been done elsewhere would reap valuable rewards when applied to our local species. Avian physiology is little further advanced and one might wonder that the increased amount of university work in ornithology has not included this approach. " Birds " concludes with a review of new developments related largely to " the upsurge in exploitation of the environment " which has forced " the realisation that a parallel upsurge is needed in the effort to learn more about the numbers and distribution of as many species of birds as possible, especially some of the rarer species, and to determine their habitat requirements so that suitable areas may be set aside as reserves of various kinds." The OSNZ bird mapping scheme, the Wildlife forest, wetland, coastal, and island surveys, and the Mt Bruce Native Bird Reserve, the Ecology Division's Orongorongo Ranges field station and the OSNZ Nest Record Scheme and Beach Patrol Scheme are all mentioned as contributing materially to this aim.

Finally, Dr Williams makes an assessment of ornithological research in New Zealand as he sees it and points to the future. Apart from the weakness in ethology and physiology, the following needs are stated:

> " There is still need for critical re-examination of the taxonomy and distribution of such well-known genera as the kiwis and parakeets: Little is known of the details of distribution where the various species of each are sympatric, or about the factors that are responsible for maintaining their ecological separation. And there is still much to be learnt about the factors that separate sympatric species of shags. In fact, there are large gaps in our knowledge of the basic biology of many native — and introduced — species. And although there would be wide interest in quantitative comparisons of aspects of the ecology of introduced species between their native and " adopted " countries, little work has been done . . . Quantitative studies of predation and other interactions between species . . . also call for more attention and, in spite of their intrinsic difficulties, will no doubt get it eventually."

Such a tabulation of desiderata is a challenge to all ornithologists, both professional and amateur. It will be rather interesting to read what will be said in, say, 25 years hence in a similar " assessment and prospect."

But perhaps the most timely (even if written as of 1971) and unquestionably stimulating contribution comes from the hand of Professor J. T. Salmon, well known for his outspoken views on environmental matters, who tries to answer the " so what ? " and " where do we go from here ? " kinds of questions that must have been suggesting themselves as we read the earlier chapters. Not much of what he says is necessarily new, naturally enough, but related to what has gone before, it represents Professor Salmon's finest attempt to bring home to all of us, whether we are fighters for the cause or content to lurk in our ivory towers, that conservation *is* an issue that concerns each one of us. True, we must know *what* we are attempting to conserve and whether all of it is equally important in this day when the ecological balance has to be tipped one way or the other if the " quality of life " (a well worked expression which, nevertheless, means an acceptable standard of life, as well as progress and a bouyant economy, but with a profound regard for our grandchildren's place on earth) is to be maintained or even improved. Professor Salmon pulls no punches and we may squirm ourselves at his finger pointing at our lack of concern or involvement. A particularly useful feature is his listing of all the Acts which relate to environmental matters, a guaranteed surprise for even the supposedly well-informed conservationist !

Taken together the various contributions of the *Natural History of New Zealand,* linked by Salmon's message of concern brightened by hope, is a most commendable effort. One sympathises with the editor's task of reducing the original bulk of the manuscripts for which even a two-volume treatment would have been welcome as users will agree when they want more from their favourite authors; thirty odd pages sometimes stimulate as much as they inform ! We may look elsewhere for some particular information or for alternative interpretations of natural phenomena such as in the not yet useless *N.Z. Junior Encyclopaedia* (N.Z. Educational Institute, 1960) or the *Encyclopaedia of New Zealand* (Government Printer, 1966) as well as in the specialised papers and monographs to which the authors refer us. Even Homer nods, we are told, so the user may well find errors or faults that irk him in this regrettably little-publicised volume but those who want to be " up to date " on good authority on nature or the natural history of our country can turn to no other place than *The Natural History of New Zealand — An ecological survey.* As Sheila Natusch has remarked in her review of this book *(N.Z. Book World* No. 10, June/July 1974: 22-23) — " A panel of authors of this calibre deserves a panel of equally reputable reviewers. The trouble is that nobody as good as that has the time — and who would have the space ? " So let us be content and agree with her that " . . . this reference work is ' right as right can be ' almost to the present published minute."

E. W. D.

*Birds of Australia. A summary of information.* Pp. 1-552, text illus., col. pls 1-24, 300 maps. By J. D. Macdonald. With a contribution by D. L. Serventy. Illustrated by Peter Slater. Sydney, *&c.*: A. H. & A. W. Reed Pty Ltd. NZ $18.50.

The publication in 1948 of Serventy and Whittell's " Birds of Western Australia " came at the right moment to provide a sharp stimulus to critical ornithology in Australia. In the ensuing quarter of a century a growing awareness of the unique character of the natural heritage of that great isolated continent has led to a spate of books and booklets, good, bad and indifferent.

This solid volume is in the very top class, for although it modestly claims to be a ' summary of information,' it lists 745 species of which only 20 are introduced (N.Z. readers please note), it is generously illustrated and the text is fortified by maps. For 25 years the author was in charge of the Bird Room at South Kensington and *inter alia* he became an authority on the birds of Africa. When the famous Mathews collection of Australian birds, many being type specimens, which had been deposited at Tring, unexpectedly crossed the Atlantic in the 1930s after the Rothschild collection was sold to the American Museum of Natural History, there were big gaps in the collections of Australian birds available to ornithologists in Britain. It was part of the author's work to remedy these deficiencies. Through the generosity of a great Anglo-Australian, Major Harold Hall, five special expeditions were planned after World War Two. On the first of these a new Babbler was found in South Queensland and named in honour of Harold Hall. Subsequently an unknown species of Grass-wren was discovered and named in 1968. Another mark of the up-to-dateness of this workmanlike book is a map (No. 39) of the known distribution in Australia of the Sarrus Crane.

In the ' Introduction ' and ' Notes on the Text,' the author covers a lot of ground with a masterly economy of words as he delineates his purpose and sets before the reader many of the facts and problems of Australian ornithology. A few typical quotations are: (a) Voice " The language of birds is a complex and vastly interesting subject, but for most species it is not well known or understood in human terms." (b) Food. " There is much to be learned." (c) Status " Most species, even the rarest, are common somewhere," an assertion, which, alas, is belied by only too many endemic New Zealand species. Throughout the book, the commentaries which precede the various groups or families are particularly informative, if e.g. one wants to know why a Heron is not an Egret or why a Wood-Swallow is not a Swallow. Similarly, in the proper place it is suggested that the Gerygone Warblers or Fairy Flycatchers may be an offshoot of the Phylloscopi or Leaf Warblers which they resemble and largely replace.

The maps are of two kinds. Scattered through the text, where relevant, are world maps of families or super-species, e.g. Pelicans, White Ibis, Jacanas, Painted Snipe, Parrots etc. But by some mischance on p. 211 New Zealand is not dotted as it should be on the map of the Psittacidae. Then near the end of the book are 300 clearly drawn maps showing distributions in Australia. These are very useful because they save both time and words. Generally it is advisable, even imperative, to read the text in conjunction with the map. Thus, those

who know the Rock Warbler (p. 348), a distinctive species which has a very restricted range, will be surprised to learn that it is 'fairly common' unless and until they realise that that description applies only to the small patch of dark shading on Map 174.

Australasian taxonomists may receive a few shocks. The author is a lumper rather than a splitter; but as he says, scientific names are "rather loose pegs to the exasperation of naturalists who want to hang their information on something stable." Some familiar generic names disappear. Here are some examples: (1) *Synoicus* gives way to *Coturnix*, thus making our enigmatic Brown Quail congeneric with the extinct Native Quail and the migratory quails, which all those millenia ago combined with manna to save the wandering Israelites from starvation in the Sinai desert. (2) Pukeko, Moorhen and Black-tailed Native Hen are all merged in the genus *Gallinula*. (3) The Spur-winged Plover is no longer *Lobibyx* but *Vanellus;* but *Crocethia* is retained to keep the Sanderling in a monotypic genus. The Black-tailed Godwit which visits Australasia is called *Limosa limosa* with no mention of *melanuroides*. (5) *Gelochelidon* for the Gull-billed Tern and (6) *Chlidonias* for the marsh terns disappear and are replaced by *Sterna*. The Caspian Tern becomes simply *Sterna caspia,* thus losing some barbaric handles which have been foisted upon it from time to time. (7) For the White Noddy *Gygis* is out of favour and *Anous* is in.

Dr D. L. Serventy, most scholarly of Australian ornithologists, has contributed a thoughtful essay on the "Origin and Structure of Australian Bird Fauna." Writing in his usual lucid manner he discusses such problems as climatic and topographic change, isolation, continental drift; and a section on relations with neighbouring islands is particularly relevant. For serious New Zealand ornithologists, as they try to piece together the riddles of present distribution, the fossils of Gondwanaland will soon be compulsory reading!

Of the 745 species listed, 467 are illustrated in one form or another and the artist deserves the warmest praise. 24 coloured plates in which the sheer brilliance of many Australian birds is reproduced most successfully, occupy the middle of the book. On Plate 6 one has the agreeable surprise of finding such pronounced Australian endemics as Peltohyas and Stiltia bedded down beside such rare waifs as Upland Plover and two species of phalarope, all in glorious colour, which also emphasises the strangeness of the Painted Snipe. Very helpful too are the finely drawn black and white sketches which accompany the text. Naturalists in New Zealand should particularly study those of ducks (p. 87), waders (p. 159), cuckooshrikes (p. 289), wood swallows (p. 466). Some, e.g. petrels (p. 44), dotterels (p. 152), terns (p. 195), appear to owe something to illustrations which have appeared in recent New Zealand publications. Only once in a while does the artist fall from his high standard. Why is the Red-necked Stint made to look bigger than the Knot (p. 169)? The stances of the Grey-tailed Tattler (p. 167) and Broad-billed Sandpiper (p. 171) are stiffly unrealistic. But these are very minor grumbles.

For New Zealanders perhaps the least satisfactory section of the book is that dealing with the tubenoses. The ancient legend that the Wandering Albatross has the largest wingspan of all birds is repeated, though as far back as 1891 Buller claimed that "*diomedea regia* is appreciably larger"; and more recently, investigations by Bailey,

Sorensen and Westerskov substantiate his claim. Finally, although support for the author's view comes from L. H. Matthews in "A New Dictionary of birds" (1964), Serventy, Serventy & Warham (1971) concede that the Royal is slightly bigger. It is understandable that in an Australian list their one breeding albatross, *Diomedea cauta,* should be placed first, but the subsequent arrangement with the 'Greaters' in the middle of the 'Lessers' seems rather disorderly. Surely the Sooty Albatross is a regular visitor to the Great Australian Bight rather than a 'rare straggler.' Whereas the Manx Shearwater is admitted on the strength of a single banded but battered beach-wreck, Hutton's Shearwater, a regular even if rather anomalous migrant, is reduced to a comment under *Puffinus gavia.* Cook Petrel — note that apostrophe s is now dropped from many names in this book — is listed as a 'visitor probably from New Zealand.' Where else could they come from, for the so-called Cook Petrels *(defillipiana)* of the south-eastern Pacific are so different as probably to warrant full specific status ?

It is pleasing to see the use of vernacular names such as Pediunker instead of the insipid Grey Petrel; and Shoemaker instead of White-chinned Petrel which so often is a misnomer. But Giant Petrel is retained in preference to Nelly, the adoption of which would take some of the clumsiness out of the popular names of the two species which the author accepts. Southern Nelly has a brisk ring about it.

This is a book of real quality, thoughtful in its planning and polished in its fulfilment. As a major contribution to Australian ornithology it cannot lightly be disregarded. Any lover of the birds of Australasia will be proud to have it on his shelves and will be using it continually.

R. B. S.

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*Marion and Prince Edward Islands. Report on the South African Biological & Geological Expedition 1965-1966.* Sponsored by the Department of Transport of the Republic of South Africa and supervised by the South African Committee for Antarctic Research. Edited by E. M. van Zinderen Bakker Sr., J. M. Winterbottom and R. A. Dyer. Pp. xii + 1-427, frontis., text illus., col. pls 1-24, black & white pls 1-89. Cape Town: A. A. Balkema. R. 22.50, NZ $25.33.

In a time of greater and greater specialisation it is a pleasure to find a book that not only maintains a high scientific standard but also is general in its coverage. This book follows the tradition of the reports of the great European scientific expeditions of almost a century ago and is a welcome addition to such works as Chilton's "Subantarctic Islands of New Zealand" and the recent publications on Antarctica.

The various sections of the book cover the climate and geology, botany, ornithology and zoology of Marion and Prince Edward Islands. Altogether there are 37 papers of which five deal with ornithology, one in a general section by E. M. van Zinderen Bakker Jr. and four in the zoology section, three by the previous author and one by Dr J. M. Winterbottom, Director of the Percy Fitzpatrick Institute for African Ornithology. This paper "The Position of Marion Island in the Sub-

Antarctic Avifauna " is a detailed and authoritative review of the marine avifauna breeding in the Antarctic and Subantarctic. A number of interesting conclusions emerge from this review. Of the papers by van Zindern Bakker, the first " Comparative Avian Ecology " covers the habitat preferences of 26 species of breeding sea bird and the competition, for food during the chick rearing period. The second is a list of the birds observed at sea between Cape Town and Prince Edward Island. Thirdly there is a very extensive well illustrated paper " A Behaviour Analysis of the Gentoo Penguin " in which an annual cycle of the behavioural phases of this bird is worked out. The final ornithological paper " The Genus Diomedea " describes the breeding cycles of the Grey-headed Mollymawk, the Yellow-nosed Albatross and the Wandering Albatross, going into considerable detail with the last named species.

This is a book both for the amateur and specialist. For the former it will have interest in the detailed descriptions of plant and bird life, including the behaviour study of the Gentoo Penguin, all of which are illustrated with drawings and excellent photographs, often in colour. For the latter this book is an important contribution to our knowledge of subantarctic islands and is essential in the library of any institution or laboratory concerned with the plants, birds, invertebrates and geology of the antarctic and subantarctic regions.

G. W. R.

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*Avian Anatomy — Integument.* U.S. Department of Agriculture Handbook 362 — an additional note.

In addition to the review of this work given in the last issue of this journal (E.W.D., *Notornis* 21 (1): 96-97, March 1974), a review by Walter J. Bock has appeared in *The Auk* (91 (1): 207-208, January 1974) in which further appreciative remarks are made of the worth of this monograph " for which reviews are superfluous " and which is described " simply as magnificent." However, unknown to the *Notornis* reviewer, although these two volumes on the integument were to be the first of a long series covering all aspects of the gross anatomy of birds, the *Auk* reviewer has now informed us that the Avian Anatomy Project of the U.S. Department of Agriculture was terminated two years ago before further volumes could be completed. This will be a bitter disappointment to those of us whose appetites were whetted by the first volumes which we will now value all the more.

The reviewer of this work in *Nature* (218 (5449): 62, 12 April 1974, D. W. Snow) also believes these volumes to be but the first: " If the standard of those that are to come equals the first, this long-continued and costly undertaking will be fully justified." He notes, amongst other things, that — " The mass of detail that is provided is made digestible, indeed very pleasantly digestible, by the clarity with which it is presented, both in the text and in the figures, and by the care that has been taken to subdivide and index it." The volumes reviewed in *Notornis* are now in the OSNZ library where they will be freely available but the serious student is, nevertheless, urged to invest US $16.25 in his own set while he can get it.

E. W. D.

# ABOUT OUR AUTHORS

KENNETH C. PARKES is Curator of Birds at the Carnegie Museum of Natural History in Pittsburgh, Pennsylvania. He writes about himself in this way: " I was born in 1922, and received both my undergraduate and graduate education at Cornell University, attaining the Ph.D. in 1952. I joined the staff of the Carnegie Museum (as of this year, now officially Carnegie Museum of Natural History) as Assistant Curator of Birds in 1953 and have risen to the rank of Curator of Birds. I am generally considered to be a taxonomist, but my interests within ornithology are actually rather wide. Within taxonomy, I have specialized in the birds of the New World Tropics and of the Philippine Islands. Another major interest is in moults and plumages — I am the Parkes of the Humphrey-Parkes terminology for moults and plumages (*Auk* 1959). I have done field work in the Philippines, Argentina, Mexico, and various parts of the United States and Canada. I have about 250 " titles " in my bibliography, and am currently President of the Wilson Ornithological Society. I don't know when I will find the time to prepare a full list of the Buller specimens in our collection, but I have every intention of doing so eventually as I think it would be quite valuable for New Zealand ornithologists."

JOHN JENKINS was introduced to readers in the June 1973 issue of *Notornis*. He is at present Master of the *" Union South Pacific."*

RAY PIERCE is a third-year Zoology student at the University of Otago. He has been a member of the OSNZ for the past seven years and has been active in the South Island and Stewart Island especially on Canterbury river beds and lake shores. He is mainly interested in terns and is surveying the distribution of Caspian Terns in Canterbury. Beach patrolling, nest recording and making regular counts of birds at Lake Ellesmere and other Canterbury lakes.

J. A. BARTLE, universally known as " SANDY," is at present in remote parts of Afghanistan and is beyond the reach of communication until towards the end of the year. A contemporary writes about him — " Sandy Bartle's ornithological career started when he was about 12 years old. Educated in Wellington, Sandy prospered ornithologically under the guidance of a trio of well-known local ornithologists, Sir Robert Falla, Dr C. A. Fleming and Mr F. C. Kinsky. His field work has taken him to Pipinui Point, the Poor Knights Islands, the Westland Black Petrel colony, and he played a prominent part in the Victoria University surveys of the natural history of Castlepoint. Although he has received a Master of Science degree with First Class Honours from Victoria University, Sandy has not yet settled into a scientific career. He is at present travelling in Asia for about two years on a working holiday basing himself at the Indian Ocean Biological Centre of the National Institute of Oceanography at Ernakulam, South India. Earlier he had taken a year away from his university studies and worked as a fisherman on boats operating in Cook Strait, thus acquiring the material on which his present paper is based."