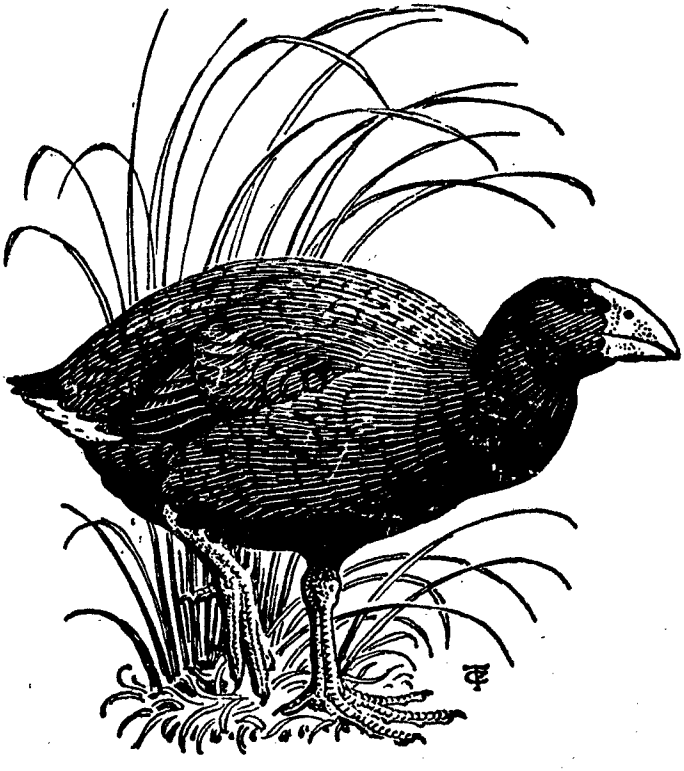
NOTORNIS



QUARTERLY JOURNAL

of the

Ornithological Society of New Zealand

(Incorporated)

Volume Fifteen, Number One, March, 1968

A BIOLOGY OF BIRDS

Many members have still to purchase a copy of this O.S.N.Z. publication.

It seems that some have been put off by the title. While parts of the text may not interest all members, most of it covers material not easily available and of close interest to anyone interested in N.Z. birds and in their conservation.

This book, a valuable companion to the *Field Guide*, was reviewed in *Notornis*, June 1967, page 85.

It is available at only $1.33 (including postage) from P.O. Box 40-272, Upper Hutt.

NOTORNIS

In continuation of New Zealand Bird Notes

Volume XV, No. 1 - - - MARCH, 1968

JOURNAL OF THE ORNITHOLOGICAL SOCIETY OF NEW ZEALAND
(Incorporated)

Registered with the G.P.O., Wellington, as a Magazine

Edited by R. B. SIBSON, 26 Entrican Avenue, Remuera, S.E. 2

Annual Subscription: Ordinary Member, £1; Endowment Member, 30/-

Life Membership, £20 (for members over thirty years of age)

Subscriptions are a minimum of £1 a year, payable at the time of application and the first of each year thereafter.

OFFICERS 1967/68

Contents of Volume 15, No. 1: March, 1968

NARRATIVE OF THE KERMADEC ISLANDS EXPEDITION 10/10/66 - 29/1/67

By D. V. MERTON

ABSTRACT

The following is intended only as a relatively brief narrative of the Ornithological Society of New Zealand's 25th Anniversary Expedition to the Kermadec Group.

A general account of the bird life and other more specific papers resulting from ornithological studies undertaken by the expedition will appear in "Notornis" at a later date.

GEOGRAPHY

The Kermadecs are comprised of two large islands and over a dozen small islands. They constitute the most northerly and the only sub-tropical islands within New Zealand's faunal region. Raoul is the major and only habitable island and has an area of 7,260 acres and rises to 1,694 ft. above sea level. Its position is 29° 16′ S. and 117° 56′ W. Cape Brett is the nearest New Zealand landfall, 611 statute miles miles to the south-west; the distance from Auckland is 674 miles, Norfolk Island is about 600 miles due west and Tonga a similar distance to the north.

Macauley, 756 acres, is the second largest island and lies 67 miles south-west of Raoul. Twenty miles south again are Curtis and Cheeseman Islands (128 and 12 acres respectively). All islands are of volcanic origin, Curtis and Raoul being active andesitic volcanoes.

Most of the smaller islands are situated in the Herald Group off the north-east coast of Raoul. The largest is Meyer Island, a little over a mile north-east of Rayner Point, Raoul Island. Meyer is divided into two by a narrow channel which can be waded under favourable conditions at low tide. The larger northern hummock rises to 403 ft., the southern reaches 325 ft. The total area of the two islets is approximately 40 acres.

The fauna and flora of the Kermadecs have a close affinity to those of New Zealand but with a strong sub-tropical element. Edgar, Kinsky and Williams (1965) give a more comprehensive description of Raoul Island together with some of its most fascinating history.

PREPARATION

After an untimely volcanic eruption caused the total evacuation of Raoul Island only two days after our 1964 party had arrived (see account by Edgar, Kinsky & Williams 1965), expedition members were unanimous that the expedition should not be abandoned but rather postponed until seismic activity had subsided. Subsequently the Society's Kermadec Sub-committee successfully recommended to Council that the expedition be relaunched in 1966. One year was considered insufficient for the necessary planning and, in any event, the crater may not have vented all its fury beforehand. As it turned out, however, fears of the latter were unwarranted; the crater, after a series of minor eruptions which resulted in the formation of about a dozen new vents, settled down again and has shown every indication of allowing another ninety years to elapse before stirring again.

[M. F. Soper

Plate I — **Standing (Left to Right):** J. F. Anton, Dr. J. C. Watt, W. Sykes, J. A. Peart
Sitting: Dr. M. F. Soper, W. V. Ward, D. V. Merton, C. R. Veitch, D. E. Crockett

Despite this early decision it was not until mid-1966 that the Secretary for Defence (Navy) was able to confirm that return naval transport would be available. From this date on until sailing from Devonport on 10/11/1966 those taking part had much to do. Insurance was arranged through Lloyds against the unlikely event of emergency evacuation and the necessity to divert an ocean liner and members had to produce certificates of their dental and medical fitness as well as their blood group and anti-tetanus vaccination. All passed these conditions with flying colours, including our most senior member, Mr. Jim Anton, who at retiring age proved to be one of the fittest of us all.

It was unfortunate that only four of the original thirteen members were available. These were David Crockett, Science Advisor to the Wanganui Education Board; John Peart, Science Lecturer, Palmerston North Teachers' Training College; William Sykes, Botanist, Botany Division, D.S.I.R., Christchurch; and myself, a Field Officer of the Wildlife Service, Department of Internal Affairs, Auckland. Other members were Dr. Charles Watt, Entomology Division,, D.S.I.R., Nelson, Senior Scientist; Dr. Mike Soper, Registered Medical Practitioner, from Tapanui; Jim Anton, retired, from Taupo; William Ward, retired, from Nelson, and Richard Veitch, Wildlife Field Officer, from Rotorua. The party of nine was chosen from ten applicants. The duration of the trip proved too long for most. Both Entomology and Botany Divisions, D.S.I.R., were invited to nominate a specialist from their staffs.

As in 1964 the expedition was sponsored wholly by the Society and its members.

Mr. A. Blackburn, the then President, Mr. B. D. Bell and I were appointed by Council as the Kermadec Expedition Sub-committee and I was asked to become executive officer and expedition leader.

The task of planning and organising was lightened considerably when Mr. A. T. Edgar, the Society's Secretary at the time and executive officer and leader of the ill-fated 1964 Expedition, supplied details of formalities and procedures involved and in so doing considerably reduced the preliminary work. The permission of the Director General of Lands to visit the Islands and to make representative collections of plants and animals was first obtained. (The Group is a Reserve for the Preservation of Fauna and Flora.) The Department of Civil Aviation, which controls a small part of Raoul Island and maintains a weather station there, was told of our intending visit and kindly invited us to place our base camp on Low Flat not far from their establishment. The radio telephone link with New Zealand and a host of other services extended to the 1964 Expedition were again offered to us and were most welcome. We greatly appreciated the warm hospitality and co-operation shown us by Francis Dickie, Officer in Charge, and members of the 1966-67 Raoul Island Civil Aviation Expedition. Their kindness contributed directly to the success of our venture.

As I was the only member living in Auckland, the port of departure, there were pitfalls. The purchase and packing of all stores inevitably fell my way. These were sorted into three lots, i.e., Base Camp, Denham Bay Camp, and Meyer Island Camp, and marked accordingly. Most items were first sealed in plastic bags to guard against the very real danger of a wetting while being landed. In

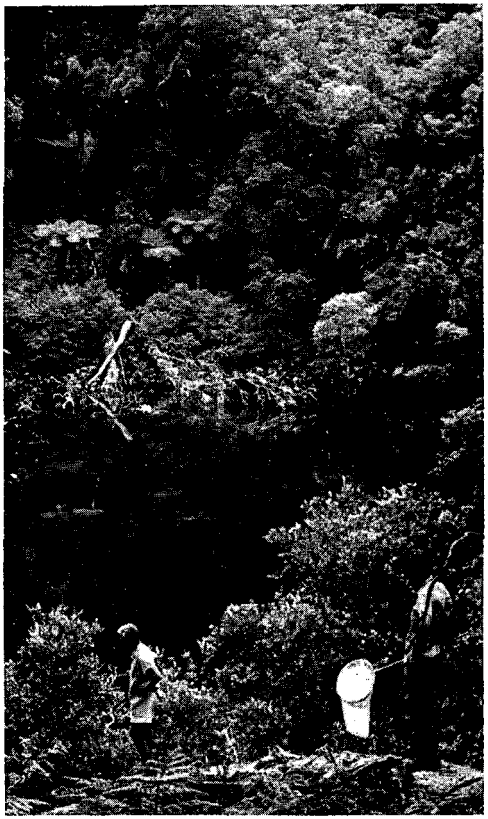


Plate II —

(a) Tui Lake

[D. V. Merton

[D. V. Merton

(b) Devastated ridge, showing damage done by the volcanic eruption of 1964. Note regrowth on some pohutukawa trunks.

the latter stages I was helped by Richard Veitch who, on arrival at Raoul, assumed responsibility for stores and their allocation. Thanks to his devotion to duty stores worked out perfectly despite some potentially heavy-handed cooks!

OUTWARD JOURNEY

H.M.N.Z.S. "Inverell" was loaded on the morning prior to sailing. John Peart and David Crockett were whisked from the Auckland railway station on arrival, and before they had breakfasted, to the Department of Internal Affairs store where a large truck was waiting to be loaded. Thirty minutes later the heavily-laden truck departed for the Naval Base. At the ship's side the load was soon stowed aboard, thanks to the help of many sailors. It was nearly 11 a.m. before two famished ornithologists sat down to a belated breakfast.

At 3 p.m. a small crowd gathered to farewell us and shortly afterwards "Inverell" cast off. For some time the figures of Mr. and Mrs. Ross McKenzie, Mr. and Mrs. Fooks, Mrs. and Fiona Anton and Margaret Merton were discernible on the rapidly diminishing pier.

Telegrams wishing us Bon Voyage from the President, Mr. A. Blackburn, the Secretary Mr. A. T. Edgar, Council Members Dr. R. A. Falla, Mr. and Mrs. Denis McGrath and Mr. B. D. Bell, and members of the earlier expedition, Alan Wright and Peter Child, were received along with many others. Alan wished us luck and hoped that the pot wouldn't boil over this time.

The tedious preparatory stage had ended at last and our adventure had begun. For two and a half days while we were at sea the weather was perfect and with a few exceptions we all proved good sailors. I cannot recall this outward voyage without mentioning "Inverell's" steering motor which, situated just through the bulkhead from our accommodation, sounded for all the world like a pneumatic hammer each time the helm was corrected. Surprisingly enough, this did not bother us after the first few hours. We kept a bird-log during daylight hours and the photographers in the party tried with considerable success to photograph the Wandering Albatrosses and other species which maintained station off "Inverell's" stern.

Each evening two or three of us were invited to pay a social visit to the Commanding Officer, Lieutenant Commander Steward, who, with his whole ship's company, was most hospitable.

On the evening of 12/11/1966 we sighted Curtis Island and later Macauley Island off our starboard bow but our course did not take us close to either.

ARRIVAL

Daylight next morning found us at anchor off Fishing Rock, Raoul Island, and soon afterwards a boat was lowered and unloading began. Most stores and equipment for Meyer Island, including three 44-gallon drums containing drinking water, were taken directly to Meyer; all else was landed at Fishing Rock and taken by truck to the site of our base camp.

With the help of members of the Met. party who manned the crane at Fishing Rock, the flying fox between Fishing Rock and the road-head 300 ft. above and then carted our gear by truck to camp, what would have otherwise taken days was accomplished in hours.

[D. V. Merton

Plate III — (a) Mudflats at eastern end of Blue Lake, a haunt of migrating waders.

[D. V. Merton

(b) View of crater from near summit of Mt. Prospect. Green Lake in foreground and Blue Lake behind.

Weather generally throughout our stay was good although the seasonally-prevailing north-easterly winds did not give us the most favourable seas for travel amongst the Herald Islets or landing on North Beach. A little rain fell during the early stages, and towards the end, very humid conditions were followed by torrential rains which on Meyer washed out a number of David's nesting Wedge-tailed Shearwaters (*Puffinus pacificus pacificus*). The extreme humidity caused numerous problems, not the least of which concerned Bill Syke's plant presses in which leaves of almost every plant encountered on the island were in the process of being pressed and dried. The added moisture had the disturbing effect of causing some of Bill's specimens to *grow* despite all efforts to dry them out.

With our camp established in a well-drained and sheltered position not far from North Beach and in the shade of a grove of Pohutukawa, we at once set about establishing satellite camps at Denham Bay and on North Meyer Islet.

DENHAM BAY

Our first portage from Low Flat to Denham Bay will not be remembered for its fast time but rather for the quantities of sweat we lost. The track climbs over 1000 ft. to skirt the western rim of the crater before descending the sheer cliffs of Denham Bay. When negotiating this part of the track we could not but marvel at the work put into its construction, for it has been hewn with pick and shovel out of solid rock. A credit to the Niue Islanders who earlier this century left their mark on Raoul Island in so many ways.

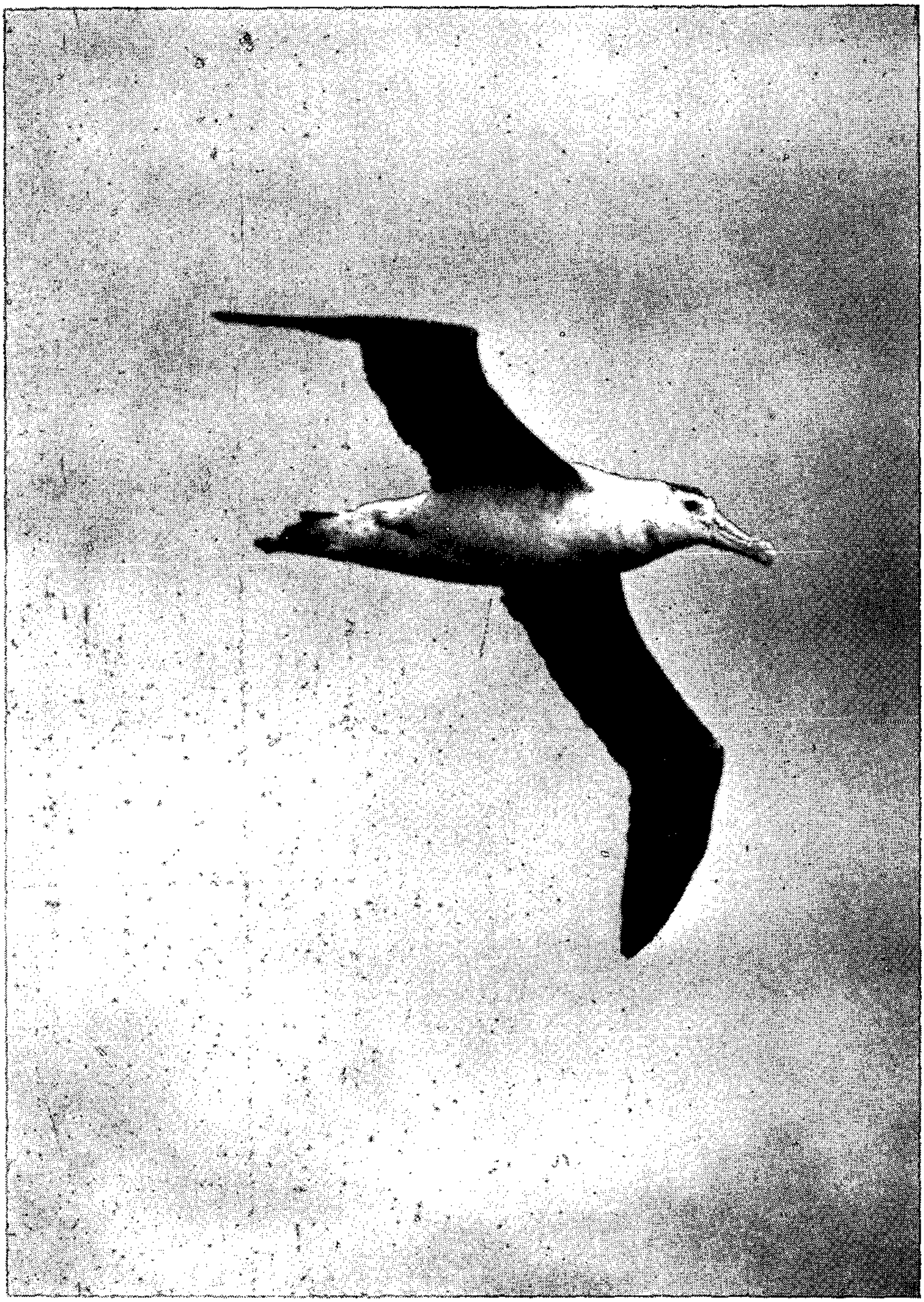
Before long John Peart was well installed in his camp and, accompanied by Richard Veitch, had begun working on the Sooty Tern (*Sterna fuscata*) colony, where laying had not yet begun.

MEYER ISLET

We had been told that the Denham Bay surf was invariably heavy and dangerous, but we soon found that during our stay at least, there was hardly a day went by when a boat could not have landed with ease and safety. The northern coast, however, with its prevailing on-shore summer winds was not so amiable and the launching of our 12ft. 6in. dinghy from North Beach never failed to create some apprehension. The establishment of a camp on Meyer, then, was not without its difficulties. During our numerous landings and departures on North Beach on no occasion did we tip out or encounter real trouble although the often substantial quantities of water shipped soon became commonplace.

It was not until 19 November that the sea abated enough to allow a crossing to Meyer. Mike and Don took the first load across. Don then returned for a second load while Mike set about erecting camp. The perfect setting for a permanent camp was found on North Meyer Islet just above a small sheltered and almost all-weather boat harbour, both being rare attributes of an island of this size. With very little work a level site was cleared for the 15 x 10 tent.

By the time a second load had been landed by Richard and Don the weather had deteriorated and the sea was rising. It was not until five days later that the ferrying of gear could be continued,



[M. F. Soper

Plate IV — Sub-adult Wandering Albatross **(Diomedea exulans)**, summering in Northern New Zealand waters.

but the three thus marooned made good use of the involuntary stay even though some heavy rain fell. The fact that the canned meat destined for Meyer was still on Raoul, and that salmon was the only substitute available was of little account. The fresh fish caught was hardly a change. Our radio telephone was working well so that we had daily communication with Raoul and this continued throughout Meyer's occupation, a considerable comfort to all concerned.

RAOUL ISLAND

On the following day Bill Ward and David replaced Richard and Don on Meyer while those at base camp prepared for the first of a number of walk-abouts to explore the more remote parts of the mainland. Raoul Island is poorly watered especially now that the water of the two large crater lakes is polluted (a result of the volcanic activity two years earlier) and so sufficient water for our needs had to be carried. The length of time away from a water supply was therefore limited to the amount of water we could carry. This generally lasted for about three days. While traversing Devastated Ridge which separates Blue and Green Lakes, we were amazed to find plants such as sweet william, carnations, carrots, turnips, tomatoes, radish, rye grass and clover growing in sheltered places among the eruption-killed pohutukawas on the bare volcanic pumice. This was enough to make any botanist give up, but the problem of how they came to be growing in such an unlikely place was solved by Tony Blake the Met. station farm manager, who was spending his second successive year on Raoul. He explained that the 1965/66 Met. party had planted them to brighten up the volcano scarred crater area and to provide nourishment for goat-hunting parties!

One would expect that the "going" on Raoul would be easy with so many goats to open up the undergrowth but such was not the case. The forest floor was often littered with windfalls (a result of the occasional hurricane) through which a vigorous growth of the unpalatable Aroid (*Alocasia macrorrhiza*) and *Pteris comans* fern had grown. The goats had formed tracks beneath this effective barrier which were, of course, of little use to a man with a pack. This, combined with Raoul's comparatively high temperatures and humidity made the going slow and arduous. However, by the end of our stay there were few parts of Raoul which we had not covered. These walk-abouts invariably ended in the grove where an almost inexhaustible supply of the most delicious oranges grew.

MAMMALS

The biggest biological disappointment of all was Raoul Island itself where the introduction of goats, cats, and more recently, mice and Norway rats has caused dramatic changes in the island's ecology. For this very reason it was important that the now impoverished native bird fauna of Raoul receive our full attention. Goats, cats and rats were found throughout the island but the mice were mainly confined to the Met. station farm.

The goats are alleged to have been introduced in 1842 from Samoa by a Mr. Baker, one of the earliest settlers. They have played a major role in modifying the island's vegetation so that today the

[M. F. Soper

Plate V — Young Black-browed Mollymawk **(Diomedea melanophris).** Note the dusky underwing and well-marked collar.

less palatable species alone are regenerating successfully. Seedlings of the more palatable endemic five-finger, mahoe, tree ferns, *Homolanthus,* tutu, karo, nikau, *Asplenium, Blechnum* and even pohutukawa are all heavily browsed and regenerate only in inaccessible places such as on cliff faces or as epiphytes. The endemic Hebe was not found and has possibly gone completely.

In their efforts to obtain foliage and epiphytes, goats often climbed sloping pohutukawa trunks and limbs so that it was not unusual to find these "arboreal" animals forty feet or more above the ground. The aroid mentioned earlier was introduced by the settlers for food and is, unfortunately, one of the most successful introduced species. It has spread to almost all parts of Raoul, often forming dense stands of up to seven feet high, and also occurs on both Meyer Islets. Tui Lake, a tiny crater lake previously surrounded by tree ferns, was once said to be the most beautiful place on Raoul. Today, however, few tree ferns remain and the edges are choked with aroid. A certain member of our party in whose botanical knowledge we had the utmost faith assured us that the aroid, now so common on Raoul, bore an edible tuber, and offered to prepare some for us to try. After much boiling and changing of water they were duly dished up but, alas, one taste was more than enough. The first impression was of a rather tasteless waxy potato but this was followed almost immediately by the sensation of a thousand hypodermic needles piercing one's tonsils. This agony continued for up to ten minutes despite all efforts to diminish it. The tongue and mouth then became partially paralysed, but it was many more minutes before we recovered and considerably longer before our faith was again restored in our botanist. An admission from the expert that he had not cooked the tubers for long enough was little consolation.

Rats were to be found over all parts of Raoul and had an almost universal and unlimited food supply in the nikau fruit. As one would expect, they made good use of Sooty Tern eggs at the two large colonies; and John, who studied the Denham Bay colony, recorded interesting details of rat predation within the confines of his study areas. In a single night 46 eggs were taken in a small area and over a period many hundreds were lost, some sub-colonies being completely wiped out.

Our trapping confirmed the continued existence of Kiore (*Rattus exulans*), the last previously recorded being in 1944 (Watson 1956 unpublished). Of 19 rats we collected, 8 were Kiores. No obvious pattern of distribution was apparent, both Kiores and Norway Rats being widespread.

BIRDLIFE

Native bird life on Raoul was most disappointing. It was certainly a far cry from 1908 when Oliver and Iredale spent 10 months ashore. For instance, these writers recorded Kermadec Petrel (*Pterodroma neglecta*) nesting in tens of thousands. Indeed the young, known locally as "boobies," were harvested in large numbers, e.g., 12,000 in 1889 (Cheeseman 1891) by the settlers. The species bred on the surface at a density of 800 nests per half acre, early this century, but during our stay evidence of only two nests could be found. The extraordinarily placid nature of these birds would make the Kermadec Petrel most

vulnerable to attack by cats, but it is apparently only since the arrival of Norway Rats in about 1921 that its numbers on the main island have declined spectacularly.

Both Wedge-tailed Shearwater and Black-winged Petrel (*Pterodroma hypoleuca nigripennis*) were attempting to breed on Raoul in the face of heavy predation by cats. At d'Arcy Point, previously one of Raoul Island's major Wedge-tailed Shearwater colonies, only twenty occupied burrows could be found amongst the many hundreds of unoccupied burrows, and the remains of 46 freshly eaten shearwaters. We could find no evidence that Black-winged Petrels were breeding successfully on Raoul. The large number of cat-eaten remains indicates that these small petrels were attempting to breed but that they were taken as soon as they landed. Nearby on Meyer, however, the burrow density was as great as 22 per 10 sq, metre plot.

The abundance of sign found indicates that cats are widespread and plentiful on Raoul. During his seven months' stay in 1944 Sorensen accounted for 92 (Watson 1956 unpublished) but apparently made little impression upon the island's population.

Despite our efforts to locate the rare endemic Sunday Island Petrel (*Pterodroma externa cervicalis*), which was known to breed in small numbers high on Raoul Island earlier this century, none was found. Bill Sykes did, however, find a storm wreck of this species on Bell's Beach, which proves that this striking petrel still exists.

A rather unexpected discovery was made when the cat-eaten remains of three nestling Kermadec Allied Shearwater (*Puffinus assimilis kermadecensis*) were found on Rayner Point. The species has never been recorded as breeding on Raoul although it is known to breed on most other islands in the group.

A second large breeding colony of Sooty Terns was discovered along the southern coast of Hutchinson Bluff. It was of a similar size to the well known Denham Bay colony, i.e., about forty thousand nests. Other much smaller colonies were encountered on most of the Herald Islets.

On the exposed cliffs of Smith Bluff, Grey Ternlets (*Procelsterna cerulea albivitta*) were found to have nested. About 50 birds were counted roosting in pockholes high on the Bluff but the remnants of 81 eaten by cats were found beneath. A large percentage of these were nestlings and juveniles. Grey ternlets have not previously been recorded breeding on Raoul although they breed in numbers on other islands in the group.

Kermadec Parakeets (*Cyanoramphus novaezelandiae cyanurus*) were once plentiful on Raoul but apparently vanished soon after the arrival of cats. The only evidence of them that we saw was chewed remains of one on Rayner Point. This is the nearest Raoul Island landfall to Meyer, about one mile distant, where parakeets are plentiful. This bird was most likely a new arrival from Meyer.

The variety of native bush birds is very limited. It consists of Tui (*Prosthemadera novaeseelandiae*), Parakeets, Kingfishers (*Halcyon sancta*) and the two Cuckoos. The Long-tailed (*Eudynamis taitensis*) is present the year round but the Shining (*Chalcites lucidus*) has seldom been reported. White-eyes (*Zosterops lateralis*), too, are

occasionally recorded. With such a meagre representation one would expect a great number of ecological niches to remain vacant and one of the most obvious was that of the flycatcher. It was therefore not surprising to find the Tui occupying this niche and behaving like a Fantail flitting amongst or above the foliage aerially feeding; or on the ground feeding amongst litter after the manner of a robin. Admittedly, such behaviour is not unknown in New Zealand but its occurrence at Raoul was much more frequent than on Hen Island for example. (Merton 1966).

It seems hard to imagine that any one from New Zealand would ever get excited over seeing a Black-backed Gull (*Larus dominicanus*), but the sighting of one at Denham Bay caused as much excitement as some rare vagrant would in New Zealand. At the Kermadecs this gull is a rare vagrant and our sighting was apparently the first made there.

Another small gull seen at a distance at Denham Bay was thought to have been a juvenile Red-billed Gull (*L. novaehollandiae*). The only other small gulls known from the Kermadecs were collected and are in the Otago Museum and bear the name (*Beruchigavia jamesonii*), but according to Gurr (Sorenson 1964) these may well be (*L. gunni*) from Tasmania.

The Spotless Crake (*Porzana tabuensis plumbea*) was recorded only on the Meyer Islets, where it was plentiful. Two nests were found, one unoccupied and one with chicks. The last recorded sighting of a Spotless Crake at the Kermadecs, apart from those I saw on a brief visit to Meyer during the 1964 expedition, was one seen by Lindsay (1929) on Meyer.

The eruption of 1964 has resulted in an expanse of open mud flats at the eastern end of Blue Lake which was used by both feeding and roosting waders. Depending upon the wind direction and rainfall, the waters of Blue Lake encroached or receded irregularly but on no occasion were the mud flats completely submerged and so a small mixed flock of waders was in constant attendance. Golden Plover (*Charadrius dominicus fulvus*) were most plentiful and their numbers varied from 12 to 34. Other species recorded were up to 9 Turnstones (*Arenaria interpres interpres*); up to 6 Eastern Bar-tailed Godwits (*Limosa lapponica baueri*); and 2 Asiatic Whimbrels (*Numenius phaeopus variegatus*), one of which was collected. Apart from one seen on Meyer in 1964 these appear to be the first recorded since Oliver collected one in 1908. Wandering Tattler (*Heterosceelus incanus incanus*) were commonly met with along the coast of Raoul and most islets and rock stacks offshore. The only other record of this species appears to be a specimen collected by W. S. Bell in 1913 (Oliver, 1930). The dried remains of a Knot (*Calidris canutus*) found on the Blue Lake mudflats seems to be the first report of this species in the Kermadecs since Oliver (1912) recorded one taken in Denham Bay in 1910. The only cmpletely new record for the Kermadecs was the sighting of a Grey Plover (*Charadrius squatarola*) on the Meyer Islet rock shelf by David and Jim.

The common land birds of Raoul are the European Starling (*Sturnus vulgaris*), Blackbird (*Turdus merula*), Thrush (*T. musicus*) and Yellowhammer (*Emberiza citrinella*). These are all self-introduced.

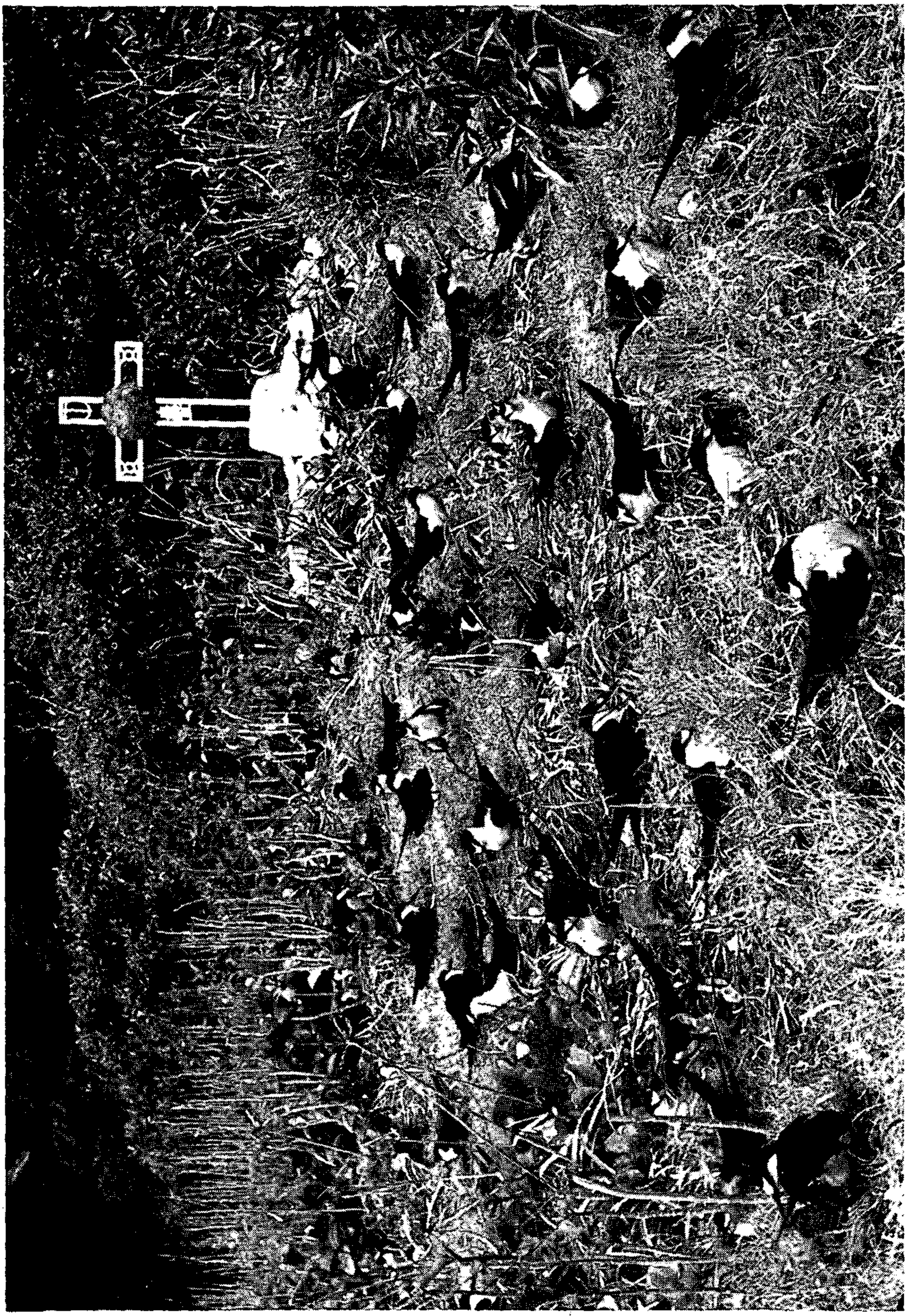


Plate VI — Sooty Terns **(Sterna fuscata)** nesting at the grave of Fleetwood Denham in Denham Bay. [M. F. Soper

presumably from New Zealand (Williams 1953). By far the most numerous was the Starling, which was seen feeding in large flocks upon the prolific insect life produced in the parts of the crater disturbed by the 1964 eruption, especially at the eastern end of Blue Lake. The seventy odd acres of pasture comprising the Met. station farm also proved attractive feeding areas for this species, large numbers of which were seen to cross to Meyer each evening to roost.

The biological highlight of the trip was, without doubt, the Meyer Islets which must be amongst the most fascinating unspoiled bird islands to be found in the world today. There are few parts not being used for nesting by at least one of the fourteen species we found here. Burrowing petrels were beneath the surface, Kermadec Petrels nested upon it. White-capped Noddies' (*Anous tenuirostris minutus*) nests festooned the branches above and cliff edges were occupied by Grey Ternlets and Red-tailed Tropic Birds (*Phaethon rubricauda roseotincta*). Other members of the expedition had good reason then to be envious of Jim and David, who spent nine successive weeks ashore on north Meyer Islet, David studying Wedge-tailed Shearwater and Jim the Kermadec and Black-winged Petrels. Jim's study programme involved recording the daily fluctuations in weight of Kermadec Petrel chicks, an activity which earned for him the title of 'Plunket Nurse Anton."

All other (five) islets comprising the Herald group were visited, some of them twice, and they proved of outstanding interest but none had quite the variety and number of birds to be found on Meyer.

A feature of these islands was the way in which the petrels and shearwaters would come and go during daylight as well as by night and so their activity and calling was continuous. This might well be a result of the apparent virtual absence of avian predators from the Kermadec group.

Of special interest were the parasitic habits of the land crab (*Geograpsus gayi*), which on Meyer often lived in shallow burrows near a Ternlet's nest. The crab, which apparently fed largely upon the food dropped by the parent bird, while feeding the chick, was sometimes twice the size of the chick. However, on no occasion did the crabs appear to have ulterior motives. On the other hand, dead chicks of all species were devoured by these crabs.

Sharks were plentiful but it was not until a day when off Smith Bluff that their potential danger was brought home to us. The fin of a large shark appeared and described a circle around us at little more than an oar's length. The dinghy suddenly seemed very small and the land a long way off.

During the latter stages of our stay large green turtles (*Chelone mydas*) were commonly seen feeding just beyond the breaker line. Once, while swimming around an obstacle en route to Smith Bluff, we noticed a turtle very close in but thought no more of it until Bill Sykes, who admits that he is no swimmer, was caught in the surge and subsequently ran "aground" on the turtle's shell! Needless to say this chance meeting was short lived.

*Plate VII — Don Merton and Dick Veitch measuring cat-killed Black-winged Petrels (**Pterodroma nigripennis**) on Raoul Island.* [M. F. Soper

FESTIVE SEASON

Time passed rapidly and before we knew it Christmas was upon us. Francis Dickie and his team of nine specialists showed us their typical hospitality by inviting us to attend a Christmas Eve barbecue near the Met. Hostel. Such social occasions were most enjoyable and the ample supply of fresh meat was a welcome change to our basic diet of "bully beef," goat meat and trail biscuits.

On Christmas Day, Richard, who had already displayed considerable talent as a camp cook, produced from the camp oven roast kid fit for a king. Someone was heard to ask, "Who would eat mutton when there are goats like this about?" This, together with Mrs. Hetty McKenzie's Christmas pudding, complete with coins, given to us just prior to sailing, made the occasion a most happy and memorable one. The table had been decorated with the blooms of wild gladioli and pohutukawa and we dined by candlelight.

It was about this time that "Snowball," the Met. staff's pet goat, disappeared. Needless to say we were suspect Number One and in spite of all our protestations of innocence we never did convince Francis and his team we were not guilty. Snowball was never heard of again.

Christmas greetings were received from the President, Mr. A. Blackburn, Vice-President, Dr. Williams and his wife, the Secretary, Mr. A. T. Edgar, Treasurer, Mr. H. R. McKenzie, and his wife and Council member, Mr. N. B. McKenzie and Hawkes Bay members. The District Officer, Internal Affairs Department, Auckland, Mr. E. Burns, sent greetings and hoped that our Christmas goat was tender. Other messages were received from Murray Williams of the Wildlife Service who advised us against eating Sooty Terns for Christmas dinner and from Margaret Merton.

On New Year's Eve we entertained the Met. team at our base camp, Richard again excelling himself as chef. The goat meat and the apple pie that followed were excellent. Charles displayed unsuspected talents when he concocted a bucketful of the most delicious punch. He never did disclose the recipe although we did hear that it began, "take 200 oranges . . . . !"

No record of our experiences on Raoul Island would be complete without reference to the flies which rejoiced in our company. These came in all sizes but all were most friendly. Of particular note were the stable flies, a biting variety, which were apparently a recent arrival from New Zealand, having accompanied a young bull brought to the island. They had found optimum conditions on Raoul and had increased accordingly.

On Meyer a very vicious variety of brackish water mosquito abounded but these were not encountered on Raoul, not even at Denham Bay where the camp was sited at the edge of a swamp.

DEPARTURE

Being so busy and working long hours, we hardly noticed the time slipping by until one day in mid-January a message was received stating that H.M.N.Z.S. "Kaimai" would be at Raoul ready to embark our party at 06.00 hrs. on 27 January. The end was in sight. The prospect of returning to New Zealand was met with mixed feelings.

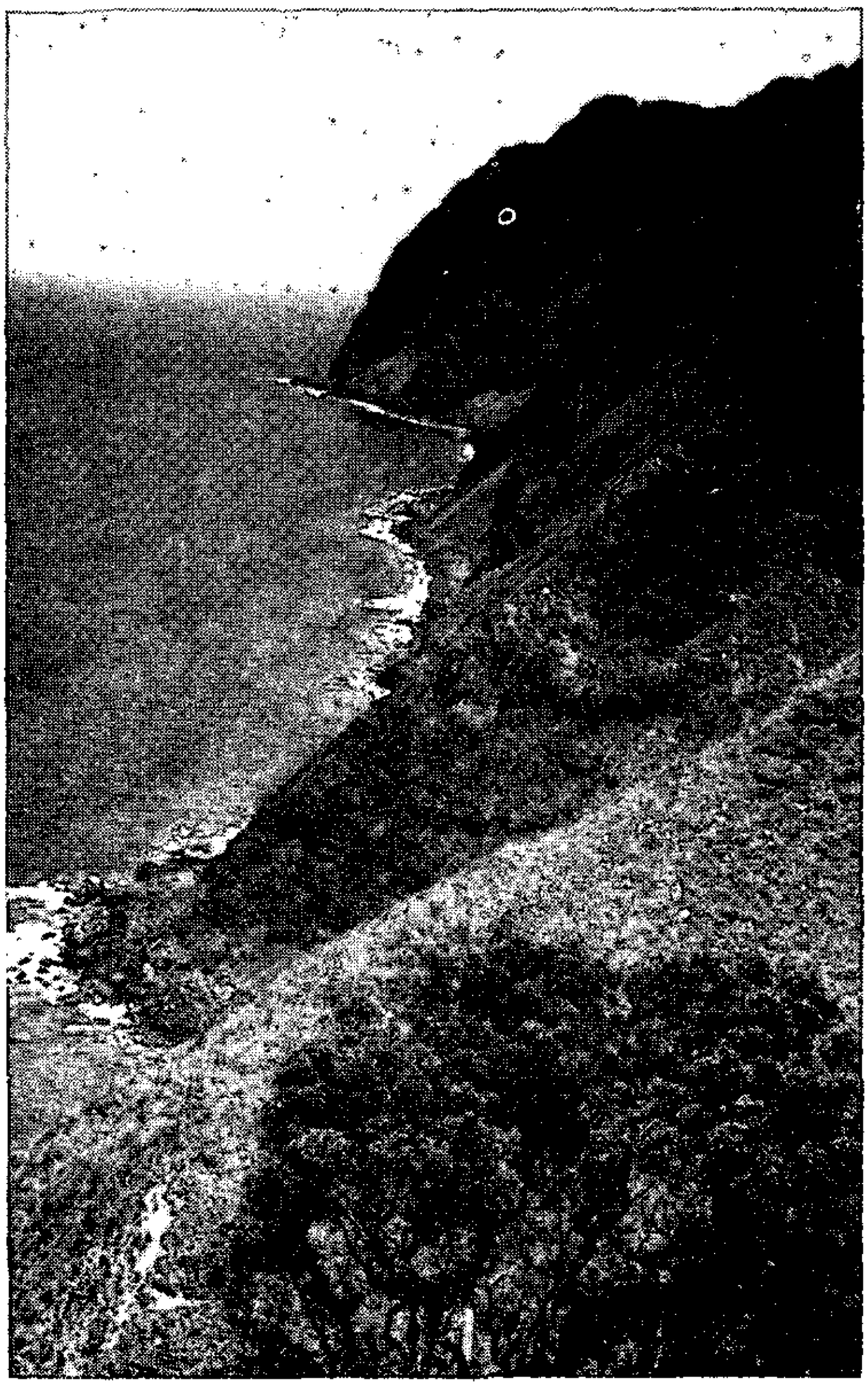


Plate VIII — View from D'Arcy Point towards Smith's Bluff, showing the coast where the Columbia River was wrecked in 1921 and where, presumably, Norway Rats got ashore. Wreckage thought to have been from this ship was found by the 1966-67 party.

While everybody was eager to be reunited with his family, all were a trifle sorry at having to leave the projects in which they were so engrossed and the peaceful setting of the Kermadecs.

On 19 January Richard and Don crossed to Meyer and together with David and Jim began dismantling and packing the camp, and on the following day everything was ferried back to Fishing Rock. Despite an exceptionally high tide and big ocean swell, all personnel and gear were landed dry at Fishing Rock.

All hands, including several of the C.A.A. staff, were at Fishing Rock to help unload the dinghy by means of the boom. The highlight of the operation came when Charles, who was hauling on a rope swinging the boom with his back to the sea, called down to the occupants of the pitching dinghy, "I'm glad it's you and not me." Only seconds later a huge swell broke over the landing platform and nearly carried the unsuspecting Charles away. The dinghy rode it with ease but when all had subsided the now sodden Charles heard his late remark echoed back to him by the smug pair in the dinghy below.

Meyer Island was left as we had found it with all traces of human occupation meticulously removed.

On 24 January the Denham Bay camp was dismantled and packed back over the saddle to Low Flat leaving the " fierce unrelenting surf " lapping gently on the shore.

By the night of 26 January everything but personal effects had been taken to Fishing Rock ready for loading. The Met. staff kindly fed and housed us at their hostel that night and so we were able to begin loading without delay early next morning. The weather was favourable and the seas slight so the task was soon accomplished. As we were being swung from the shore to the dinghy in a large wicker basket, members were, in traditional style, dunked in the tide. Not an unpleasant experience after such hot work.

Like the outward trip the run home was made under ideal conditions and excellent time. We were disappointed, however, at not having an opportunity to land or have a closer look at Macauley or Curtis Islands, as we passed 15 miles to the west.

ARRIVAL HOME

The particularly fast time we made resulted in an unscheduled early arrival back at " Philomel " and upset the plans of those relations and friends who had intended to meet us. However, it was not long before Mr. Archie Blackburn, Mr. and Mrs. Ross McKenzie, Mr. and Richard Sibson, Mr. and Mrs. Watt, Mrs. and Fiona Anton, Margaret Merton, Ruth Crockett, Mr. and Mrs. Bysouth and others arrived to welcome us home. We were also met by two Port Agriculture Inspectors who, after some discussion, seized our cases of specimens as we did not have the necessary permit to " import " them. Botanical collections were spared from a similar fate only after much hard talking by Bill Sykes and others. Several days later after the necessary permit had been arranged our specimens were released.

Gear was then taken by truck to the Department of Internal Affairs' city store for sorting before being consigned to its various destinations, a few days later, our arrival home having coincided with Auckland's anniversary holiday and so business premises were closed.

Expedition members then dispersed bringing to an end a most successful and enjoyable expedition.

In closing I would like to express the appreciation and thanks of expedition members and of myself to those who made this venture possible. Foremost amongst these are the Royal New Zealand Navy, the Department of Lands and Survey, the many sponsor members within the Society and the Civil Aviation Administration whose scientific team on Raoul contributed so much to the enjoyment and success of our visit.

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FOLLOWING IS A SUMMARY OF SOME OF THE WORK ACCOMPLISHED

1. General account of bird life. D.V.M.
2. Population and breeding biology study of Sooty Tern. J.A.P.
3. Distribution and breeding biology study of Wedge-tailed Shearwater. D.E.C.
4. Distribution and breeding biology of Grey Ternlet, White-capped Noddy and observations on behaviour of Kermadec Parakeet and Spotless Crake. M.F.S.
5. Foods and feeding stations of some native bush birds. D.V.M.
6. Bird collection and taxidermy. D.V.M., C.R.V. and D.E.C. (41 skins of 13 species were obtained).
7. Distribution and habits of European passerines. C.R.V.
8. Notes on introduced mammals (on behalf of Wildlife Service, Department of Internal Affairs). D.V.M. and C.R.V.
9. Goats and their effects upon Raoul Island's vegetation. W.R.S.
10. Census and notes on waders and migrants. J.A.P.
11. Bird banding (on behalf of Wildlife Service).
    A total of 5579 birds of 15 species was banded. Many of these species had never previously been banded in the New Zealand area. Only one recapture was made, a Red-tailed Tropic-bird. It had been banded six years earlier as a breeding adult when it nested below the flagstaff on Fleetwood Bluff, Raoul Island. When recaptured it was incubating an egg in a nest on South Meyer Islet.
12. O.S.N.Z. recording system, beach patrol and nest record cards. J.F.A. The measurements of several hundred birds representing most of the Kermadec species were recorded.
13. Notes on the distribution, status and breeding biology of Black-winged and Kermadec Petrels. J.F.A.
14. Entomology (on behalf of Entomology Division, D.S.I.R., Nelson) with particular reference to arthropod inhabitants of birds' nests and burrows and bird and animal ectoparasites. Identification of gut contents of insectivorous birds. J.C.W.
15. Botany (on behalf of Botany Division, D.S.I.R., Christchurch) surveys of Raoul and adjacent islets. W.R.S.
16. Still photography. M.F.S.
17. 16 mm. movie colour film of expedition activity. W.V.W. (It is hoped that copies will soon be available for circulation.)
18. Sound recording. W.V.W. High fidelity recordings were obtained of 15 Kermadec species.
19. Other miscellaneous material was collected for the Dominion Museum and a number of research workers. This included 49 birds eggs of 11 species, a number of bird skeletons, seashells, petrel tissues, fat and stomach oil, goat stomachs, cat stomachs and droppings, and tissues from Starlings for detection of residual poisons if any.

FOODS OF THE HARRIER

By A. L. K. CARROLL
Wildlife Service, Dept. Internal Affairs, Wellington

SUMMARY

A study of the stomach contents of 124 Harriers showed their food to be predominantly birds, mammals and insects, occasionally frogs and fish.

Birds taken were mainly House Sparrows, Blackbirds, Song Thrushes and Skylarks. Mammals, often eaten as carrion, were rabbits, hares, Australian opossums, and hedgehogs. Insects frequently present were crickets, grasshoppers and locusts (*Orthoptera*) and cicadas (*Hemiptera*).

Macerated plant material, found in many specimens, came from the gut of prey. Fresh plant fragments appeared to have been taken accidentally.

The proportions of each kind of food varied seasonally but all the main categories were represented in stomachs throughout the year. More than half the specimens contained only one food, the rest a mixture of two or more.

INTRODUCTION

Harriers (*Circus approximans*), common throughout New Zealand except in heavily forested areas, have flourished as a result of European settlement. Clearing of forest and scrubland for farming and the introduction of exotic animals have extended their hunting range and provided them with a more abundant diet. The growing number of animals killed by motor vehicles has also augmented the amount of easily-accessible food. Under such favourable conditions Harriers have become increasingly numerous and obvious.

Many farmers and sportsmen have sought the destruction of these birds because of alleged damage to stock and game. A continuing controversy between those who would conserve and those who would destroy resulted in a decision by the Department of Internal Affairs to undertake a study of their food habits in an attempt to settle the question.

MATERIAL

Over a period of three years 134 harriers were sent to the laboratory. North Island birds were from: Taupo 49, Rotorua 13, Wairoa 11, Gisborne 10, Opoutama 6, Mangere Airport 5, Whakatane-Bay of Plenty 4, miscellaneous 9. South Island birds were from: West Coast 16, Southern Lakes 7, Otago Peninsula 4.

They were collected by officers of the Wildlife Service. Sixty-five birds were shot, 54 trapped, 8 killed on the roads, two found dead, one poisoned and one killed accidentally in an opossum trap. The causes of the three remaining deaths were not known.

Of these 134 specimens, 71 were adult and 63 juvenile, i.e., first-year birds but fully-grown. Excluding three in which determination of sex was impossible because of damage, there were 61 males (40 adults, 21 juveniles) and 70 females (30 adults, 40 juveniles). Most were in good condition and many were fat; some juveniles excessively so.

An appreciable amount of food was found in 124 stomachs, the remainder being empty or nearly so. Food was analysed qualitatively only, this being considered adequate for the present study.

Identification of material was based on a comparison of diagnostic fragments (e.g., bone, beaks, feet, teeth, hairs, etc.) with specimens in the laboratory reference collection and on information given by Mr. F. Kinsky of the Dominion Museum. Authorities frequently consulted were Howard (1929), Imms (1951), Oliver (1955), Marshall (1960), Falla, Sibson and Turbott (1966).

STOMACH CONTENTS

As Harriers depend on chemical rather than mechanical processes for the breaking down of their food, presumably the stones of varying sizes found in some specimens were from gizzards of digested prey or picked up with insects or other food. Table 1 shows the occurrence of foods for each season.

Plant. Forty-two per cent of specimens contained plant material, usually in small amounts. This was nearly always macerated and appeared to be predominantly from the gut of prey. Occasionally it appeared to have been eaten as such by the Harrier, probably accidentally. Fresh plant material most commonly occurring was clover, grass leaves and moss.

Animal. Forty-six per cent of specimens contained bird remains. These included eggs and fledglings, taken from October to January. Of identifiable species, Sparrows were the most numerous, occurring in 16 (13 per cent) of the stomachs. Other species eaten included Blackbird, Thrush, Skylark, Starling, Chaffinch and duck (Table 2). "Miscellaneous" included one each of the following: Tomtit, Yellowhammer, Goldfinch. The rest could be identified only as bird tissue, diagnostic fragments being absent.

Mammalian tissue occurred in 89 stomachs. This incidence is misleading because 50 specimens were trapped. Thirty-two of these contained rabbit, commonly used as bait, and one contained Australian opossum, this being caught in the only recorded opossum-baited trap.

One-fifth of untrapped birds contained rabbit. On this basis the permissible number of rabbit occurrences in trapped birds was 10, not 32 as found, giving an estimated total of 25 rabbit occurrences.

Forty-nine per cent of Harriers were thus calculated to contain mammalian tissue (Table 1). The highest incidence was in winter (June to August), when wool appeared in nine of 21 stomachs (43 per cent), probably because of deaths among lambs and ewes at that time. Total occurrences for the year were: rabbit (20 per cent), wool from sheep or lamb (13 per cent), opossum (8 per cent), hare (6 per cent), hedgehog (6 per cent), and mouse (2 per cent).

Frogs appeared in five per cent of all specimens. As with birds and mammals, they were found throughout the year.

Four small fish bones were found in a Harrier shot at Alcock's Lagoon, Arahura, in November 1966. This was the only specimen containing fish.

Invertebrates occurred in 35 per cent of specimens. Blowfly adults, larvae and eggs are excluded from the calculations, being classified as accidental inclusions with carrion. Cicadas predominated from Decem-

ber to February and members of the grasshopper family greatly outnumbered all others from March to May. Occurrences for the whole year were: field crickets (11 per cent), grasshoppers (11 per cent), locusts (6 per cent), cicadas (6 per cent), moths adult and larval (4 per cent) and beetles adult and larval (one per cent). As would be expected, winter and spring occurrences were few (9 per cent) but high numbers were recorded for summer (37 per cent) and autumn (53 per cent).

Spiders, the only other invertebrates, appeared in 2 per cent of specimens.

The percentages given do not necessarily indicate order of preference; more likely they reflect sample size and availability of food items for each season.

SELECTION OF FOOD

Harriers took their food either singly or in combination, see Table 3. Where mammalian tissue occurred in trapped birds the same adjustment as for Table 1 was considered necessary.

Sixty-three specimens had fed on one kind of food only: 28 on birds, 25 on mammals and 10 on insects. Forty contained two kinds of food and the rest three. In some instances, insect fragments may have been liberated from the digestive tracts of birds or frogs. However, usually this was clearly not so as the insects were nearly always large and entire.

Although there were expected seasonal variations in the proportions of the various items of diet, Harriers had taken throughout the year all the main kinds of food. It is unlikely that they were to any great degree selective; they appeared rather to have fed readily on whatever was available. Many were found to have gorged on one kind of food, e.g., one contained 11 locusts, 83 field crickets and 10 grasshoppers; another contained 10 frogs and a third the remains of one Blackbird, two Thrushes and two eggs.

Undoubtedly much food originated as carrion. This was confirmed by the presence of blowfly larvae or eggs, which occurred only when mammalian or bird tissue was present. Seventeen untrapped specimens contained blowfly larvae or eggs in association with the following: bird remains only (2), bird and mammal remains (5), frog and mammal remains (1) and mammal remains only (9). Mammalian tissue occurring with blowfly in untrapped Harriers was rabbit in six specimens, opossum in five, wool in three, hedgehog in three and hare in one.

Other Harriers may very well have fed on carrion but not a blown portion. All, or nearly all, adult mammalian tissue, except mouse, could confidently be classified as carrion, much of it from road kills. Harriers probably took most birds and all mice, frogs and insects alive.

DISCUSSION

Harriers are one of the few species of native birds unprotected by law. They are treated as vermin by many farmers and sportsmen; indeed, all acclimatisation societies at one time or another have offered bounties to encourage their destruction.

Undoubtedly they prey on smaller birds and mammals but there are few authenticated reports of their killing animals larger than young hares or rabbits. Stead (1932) observed three Harriers associating to attack and kill an adult hare, and on another occasion a single Harrier killing one, but he commented that usually an adult hare, when attacked, could adequately defend itself.

Harriers are often accused of maiming or killing new lambs and cast sheep. I can find no evidence of this. However, they are known to start feeding on carcases immediately after death.

They have rarely been seen successfully attacking wild game birds, although harassment is frequently recorded. It would be safe to assume that successful attacks do occur, especially when young birds are about. The only game bird remains found in this study were of ducks. These occurred once in May, once in October and once in November, the last two being ducklings. The first duck could well have been shot and not retrieved during the open season. Thus predation of game birds by the Harriers examined was light but followed the expected pattern.

In the vicinity of nesting Canada Geese at Lake Forsyth, Harriers are very numerous. They have not at any time been seen to attack live birds or fresh eggs in occupied nests although they are known to eat deserted eggs containing full-term goslings (M. Imber pers. comm.). Their activities here are those of scavengers. Occupied Black-backed Gull nests in a colony under surveillance in the Napier area have been heavily attacked (T. A. Caithness pers. comm.). Here Harriers have regularly taken eggs from temporarily unsupervised nests. The presumption is that this has been done by only two of several Harriers present.

Probably because their depredations are easily observed, insufficient consideration has been given to the beneficial activities of Harriers. They are particularly useful as scavengers and they consume many plant-eating insects during the warmer months. Buddle (1951) contends that depredations of Harriers among game birds and poultry are less important than their limiting of the population of rats and other enemies of these birds. He quotes an American biologist, Herbert L. Stoddard, who examined stomachs of a large number of American Harriers and found they had eaten approximately 50 rats for each quail consumed. This supports Buller (1876) who says, "The rapacious birds have an important part to perform in the economy of nature."

CONCLUSION

These investigations support the view that the bulk of Harrier food is comprised of animal material valued by neither sportsmen nor farmers. Although most specimens were collected in areas where game birds should be abundant, they commonly contained more easily accessible food such as carrion, passerine birds, insects, and young rabbits and hares. This evidence substantiates reports that the majority of attacks attempted on wild game birds are unsuccessful. In most instances Harriers are foiled or routed by their intended prey.

Harriers play two important roles. As scavengers their value is clearly and directly seen. As predators their function in a healthy community is beneficial because a moderate degree of predation limits a population within the bounds of its own economy. However, among less vigorous species, e.g., our rarer native birds, any predation is harmful. Fortunately the habitat of most of these birds is well outside the range of Harriers.

ACKNOWLEDGMENTS

I should like to thank all those officers of the Wildlife Service, Department of Internal Affairs, who assisted in any way with the project, especially Dr. G. R. Williams, Mr. B. E. Reid and Mr. E. K. Saul for critically reading the manuscript.

My thanks also to Dr. P. Ralph, Victoria University of Wellington, and Mr. L. Pracey, New Zealand Forest Service, for their assistance. Especial thanks are due to Mr. F. C. Kinsky, Dominion Museum, for identification of bird material.

TABLE 1

Number of Harriers in which the main classes of foods occurred

Season	Mar. May	Jun. Aug.	Sep. Nov.	Dec. Feb.	*Number*	*Per Cent*
Sample size	34	21	11	58	124	
Food:						
Birds	10	9	7	31	57	46
Mammals	22	19	5	15	61	49
Frog/Fish	3	1	1	2	7	6
Invertebrates	18	2	1	22	43	35
Plants	11	13	–	28	52	42

TABLE 2 — Number of Harriers in which various food items occurred (total 124 Harriers)

Diet Species	*No. of occurrences*	*Diet Species*	*No. of occurrences*
Birds: Blackbird	14	Mammals: Hare	8
Chaffinch	2	Hedgehog	7
Duck	3	Mouse	2
Silvereye	3	Opossum	10
Skylark	6	Rabbit	15
Sparrow	16	Wool	16
Starling	2	Invertebrates:	
Thrush	7	Cicada	8
Misc. sp.	18	Beetle	1
Eggs	7	Cricket	14
Frogs	6	Grasshopper	13
Fish	1	Moth	5
Plant Material	52	Locust	7
		Spider	3

Notes: (a) 24 specimens contained blowfly (adult, larvae or eggs). These occurred only with carrion.

(b) An additional 32 harriers containing rabbit were excluded as these were snared with rabbit-baited traps.

TABLE 3 — Food occurrences in 110 specimens

Food Items	*No. of specimens*	
Bird only	28	
Mammal only	25	
Insect only	10	Fourteen specimens not listed
Bird and mammal	15	were trapped, containing
Bird and insect	12	mammal only.
Bird and frog	3	
Mammal and insect	8	
Mammal and frog	1	Mammalian occurrences
Insect and frog	1	include permissible
Bird, mammal, insect	5	trapped rabbit.
Bird, mammal, frog	1	
Mammal, insect, frog	1	

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WELCOME SWALLOWS IN NORTHERN HOKIANGA, 1965 - 1967

By BOB COWAN

A general survey of nest sites of the Welcome Swallow (*Hirundo neoxena*) in Northern Hokianga was made in 1965, and the results are on record (Edgar, *Notornis* 13, 53). Observations since 1965 indicate a steady increase in the swallow population of the area, and this is confirmed by my nest records for 1966 and 1967 seasons. In the following table, 1965 figures are those recorded in the 1965 survey: 1966 and 1967 figures are the result of annual checks on the same areas.

TABLE 1

Locality	*Occupied Nest Sites*		
	1965	1966	1967
Herekino to Panguru turn-off	22	26	27
Whangape harbour area	7	9	10
Runaruna area	2	5	9
Kohukohu area	4	5	8
Panguru-Mitimiti	2	4	6
Totals	37	49	60

Sites occupied in 1965 have been used again in 1966 and in 1967 with only a few exceptions, due mainly to bridge reconstruction. Two large bridges in the area were occupied in 1965 and 1966, each by three pairs of birds, and in 1967 two pairs nested in a box culvert: apart from these examples, the rule has been one site, one nest. Plenty of suitable bridge and culvert sites are still available, except perhaps in the Herekino area.

On the south side of Whangape harbour where there has been extensive bridge reconstruction, birds have been seen around, and in one case have nested on, farm buildings in this area. Also in this area, during the 1966 season, birds nested successfully on a rafter in an open shed. In the Herekino area a woolshed site has been occupied for several successive seasons. Apart from these three instances nests have been either under bridges or in culverts, except for one 1966 nest built in a shallow rock cave at Whangape.

In most cases the mudwork of nests does not last more than one season, and winter floods, of course, contribute to its destruction. Frequently, new nests are built on the exact site of a previous year's nest which has disappeared. Occasionally a new nest is constructed on top of what remains of the base of last year's nest. One 1966 nest was used again in September 1967, but abandoned after two eggs had been laid. The birds built another nest several feet away, and had success. A nest from which two families flew in 1965 was used again in 1966, when two clutches hatched and young flew: a third laying of two eggs was deserted. This is my only record of successful use of the same nest in successive seasons.

One nest, which was used successfully in 1966 and in which two eggs were laid in 1967, was recovered after it had been abandoned. It was of the unsupported variety (Edgar, *Notornis* 13, 38) but was somewhat unusual, in that at the back both sides were almost vertical, providing a greater area of support and giving the base of the nest a slightly square appearance.

TABLE 2

Measurements of above nest	
Greatest breadth (side to side), mm.	168
Greatest width (back to front), mm.	95
Greatest depth, mm.	90
Depth of egg chamber, mm.	38
Weight in ounces	12

The main bracket was constructed of mud, held together with straw, roots, and cow's hair; the rim being reinforced with a few small pebbles. The under-lining consisted of cows' hair, straw and thirty-one (31) pale brown and black poultry feathers, while the upper lining consisted of a few cows' hairs and thirty-six (36) pale brown and white poultry feathers.

In the early part of the season nests normally have an ample feather lining, but December and January nests may have only a few feathers. One December nest, which contained two eggs, was peculiar in that the outside mudwork and rim were very roughly put together and the lining consisted of a few wisps of straw with no feathers at all.

In a three-foot culvert near my home a nest was built in 1966 and another in 1967. Both were attached partly to the culvert wall and partly to a stone which protrudes through a hole in the wall. It may be of interest to record details of these nests, because in both seasons the incubation period was longer than the normal fifteen days.

1966

Date	*Time*	*Data*
October 28	13.35 hrs.	First mud brackets just finished.
November 2	09.15 hrs.	Mudwork almost complete.
„ 6	17.30 hrs.	Birds carrying feathers for lining
„ 9	07.30 hrs.	One egg.
„ 10	07.20 hrs.	Two eggs.
„ 11	06.15 hrs.	Three eggs.
„ 12	05.20 hrs.	Three eggs.
	06.03 hrs.	Four eggs.
„ 13	07.30 hrs.	Five eggs.
„ 29	18.00 hrs.	Four eggs, one young.
„ 30	06.00 hrs.	One egg, four young. The egg did not hatch.

Assuming that the last egg was laid on the morning of 13th November the period of incubation was $16\frac{1}{2}$ - 17 days.

The young birds flew, not very strongly, at 07.35 hrs. on 21st December.

1967

Date	*Time*	*Data*
October 4	07.50 hrs.	One egg.
„ 5	06.30 hrs.	One egg.
	07..40 hrs.	Two eggs.
„ 6	06.15 hrs.	Two eggs.
	08.00 hrs.	Three eggs.
„ 7	06.14 hrs.	Four eggs.
	08.30 hrs.	Five eggs.
„ 23	15.00 hrs.	Four eggs, one young.
„ 24	06.40 hrs.	Three eggs, two young.
	12.15 hrs.	One egg, four young.

The remaining egg, which proved to be infertile, was the third laid. It was unusually large, and measured 22 x 12.5 mm.

The last egg of the clutch was laid between 06.12 and 08.30 hrs. on 8th October, and the last chick hatched between 06.40 and 12.15 hrs. on 24th October, giving an incubation period of sixteen (16) days.

The young birds first took flight on 13th November (the 20th day after hatching) but returned to the nest, from which they were seen to fly at 07.45 hrs. on 15th November (22nd day after hatching).

In conclusion I would like to say that although I was unable to visit all possible nest sites in the survey area, it is obvious that the Swallow population is steadily increasing.

My thanks are due to Mr. A. T. Edgar for his assistance in compiling this article.

OBSERVATIONS OF THE NESTING ASSOCIATION OF THE COMMON STARLING AND HOUSE SPARROW

By W. M. BURROWS

An experiment was carried out to ascertain if House Sparrows (*Passer domesticus*) and Starlings (*Sturnus vulgaris*) would nest in harmony in adjoining compartments of a six-roomed nesting box. Three openings were made small for Sparrows and three large for Starlings, placed alternately. Heights of holes above the platform were also alternated. If all rooms became occupied, then each pair would have at least two other pairs of different kind in adjacent rooms.

In early August of 1950 the box was erected on a single high pole about thirty feet from a residence and facing north. This proved too late in that season. Nesting sites must have been chosen already as both Starlings and Sparrows inspected the box thoroughly but none used it. A Starling was seen to enter No. 1 room. After some time it came out and mounted the roof to inspect repeatedly the sides, back and front. This process went on many times for each of the three rooms available to it. It appeared puzzled over the similar inside of each and seemed to be trying to orient the insides with the whole of the outside. A diagram of the box follows.

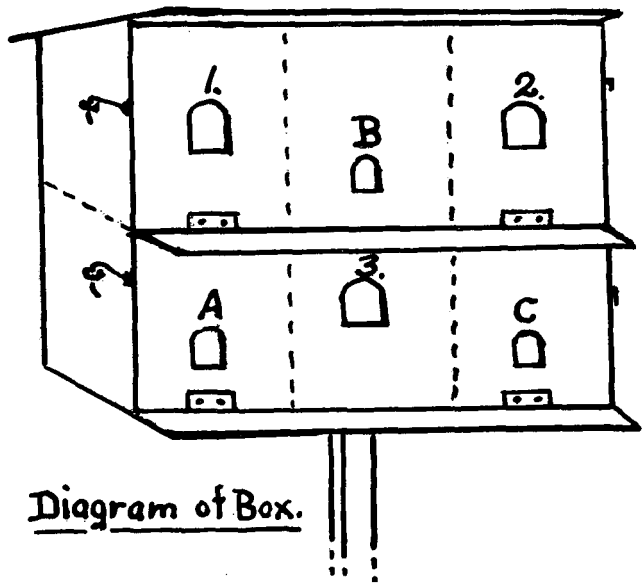

Diagram of Box.

During the following winter both Sparrows and Starlings became familiar with the box and apparently satisfied as to its safety. When it was found that hole A was too small for a Sparrow, it was enlarged, but by too much, as a Starling could get in also.

At no time in 1951 were all rooms occupied so that the full experiment was not completed. However, the following observations

showed the "mothering" instinct of a cock Starling. In November room B was occupied by a pair of Sparrows, while room A had a pair of Starlings. By Nov. 10 both pairs were brooding eggs. From Nov. 10 to 15 each morning between 7-8 the cock Starling would alight on the top of the box. He then flew to the lower ledge to peep in at the sitting hen in a scared, thin sort of way. In a moment she came bursting out to fly straight away while he invariably flew to a nearby apple tree. From there he returned to brood the eggs. The Sparrows changed over with no fuss. As soon as he arrived at the entrance, she passed him on the threshold whereupon he quickly popped in. In both cases a similar change-over often took place during late afternoon or evening.

On Nov. 16 the Sparrows hatched. Both parents were soon feeding the chicks. When the cock Starling first heard the squeaking of the sparrow chicks, he became quite excited and curious. For two days he was frequently seen to run along the top ledge, pop into the top side empty compartment, come out, peer into the Sparrows' room then enter the right side empty compartment. One day, after going through all the above performance, he squeezed into the entrance of th Sparrows' room. A moment later he appeared carrying a dropping. After that he was seen at irregular intervals taking food to the nestlings and always removing a dropping. On such occasions the Sparrows would protest loudly. If they approached him he would chase them away. However, they continued to care regularly for the nestlings. The cock Starling continued to take his turn at brooding their own eggs.

I decided to ring the young Sparrows after dark on Nov. 24. The front walls had been made to hinge down to provide access. With a net over the Starlings' entrance the box was shaken so that the occupant could be ringed. As nothing happened, the top part was let down. Then the hen Starling flew out of the lower room into the night. From the upper room the hen Sparrow and three nestlings were ringed, canary rings being used.

Next morning the cock Starling was feeding the nestlings as before while the hen Sparrow was timid and cautious but later on she fed the little ones at the doorway. The hen Starling had not come back.

On Nov. 26, the box was closely observed with field glasses at a distance of 20 yards from 12-20 to 1-20 p.m. Though showery, both hen Sparrow and cock Starling fed the chicks at intervals of about 4 mins., but more frequently when the weather cleared. The Sparrow fed them at the doorway on house scraps such as bread, porridge, etc., so the chicks found difficulty in clearing their beaks. The Starling poked in his head and shoulders, blocking out all the light and then withdrawing to peer about. This procedure was repeated up to eight times before he got rid of his offering. At one time he brought a large moth with no wings clipped, far too big for them to swallow. It took him a long time to get rid of it. Successively he brought small worms, a click beetle and caterpillars. Then he arrived with a three-inch worm very much alive. This he poked in and out with no success. Nine times he flew back to the lawn below to pinch it along its length. However they would have none of it. When only half remained, he flew to the lawn and ate it himself.

During that day the cock Sparrow was not seen. Both hen Sparrow and the Starling continued to feed the chicks all the afternoon.

The Sparrow made no attempt to clean the nest but the Starling made quick successive trips for that purpose alone. I made a close examination of the droppings to be sure of this. At intervals he slipped into his own nesting box apparently to brood the eggs his mate had left earlier. He remained for intervals of from five to ten minutes and would then bustle out to attend to the Sparrows. The young Sparrows at no time came out to meet him at the entrance though they continued to squeak loudly when he offered them food. The hen Sparrow could be plainly identified by the coloured ring put on her leg on Nov. 24.

Nov. 27. Weather remained fine. Feeding by both the hen Sparrow and the cock Starling continued, the latter still brooding the eggs in the lower compartment at odd intervals.

Nov. 28. A Starling that could have been his mate, appeared on the lawn below. He flew down, displayed, flew up to go into each compartment in turn, except the Sparrows' room. He then gathered nesting material for his own compartment.

By noon one nestling was sitting at the entrance but popped in when the Starling came to feed it. At 12.45 p.m. a nestling came out on the ledge, hopped along to the end and soon flew off to a macrocarpa hedge some six yards away. At 1.50 p.m. another came and flew off in like manner. Meanwhile the Starling continued to feed those left in the nest. On her return the mother Sparrow soon discovered the two little ones on the hedge. At 5.30 p.m. a cat caught a little one below the hedge while the mother bird called in alarm. By 6.30 p.m. the whole brood had flown. A little later the Starling brought out on to the lawn an unbroken Starling's egg from its compartment. Later the writer removed two more such eggs, finding them to contain dead chicks of about a week's development.

On Nov. 29 the parent Sparrows were heard calling about the hedge. The cock Starling returned to inspect the box, bringing another Starling with him.

On Nov. 30 the four nestlings seemed to have quite disappeared. The ringed mother Sparrow appeared in the garden in the vicinity of the box, indifferent to the nest, just feeding and resting. The cock Sparrow again appeared, showing interest in his mate and in the nest. The Starlings appeared at the box at intervals.

By Dec. 1 the same pair of Sparrows was seen mating on the ledge of the box. On Dec. 2 the cock Sparrow was seen carrying nesting material into the box at 10.30 a.m. When he came out, he made a rush to the hen bird on the hedge, being joined by two other cock Sparrows. A commotion arose in which it appeared, as observed through glasses, that the three were attempting to make a forced mating with the hen.

It was unfortunate that further observations on this experiment were unable to be made.

SUMMARY

1. It was seen that Sparrows and Starlings would nest in close proximity to each other.

2. The cries of the nestlings seemed to be the thing which set in motion the feeding and mothering instincts of the male Starling.

3. The male Starling alone would not continue to brood the eggs without the change-over with the female.

FIRST RECORD OF THE EMPEROR PENGUIN IN NEW ZEALAND

By L. E. HENDERSON

Additions to New Zealand's avifauna from the north, while not commonplace, have occurred in recent times to an extent which encourages us to look towards the Tasman or the Pacific with some anticipation. Now we have an arrival from Antarctica and the bird is flightless!

A large penguin, at first thought to be a King (*A. patagonicus*), was reported on Oreti Beach near Invercargill on 5/4/67, by Mr. F. W. Mayne. It was examined in the evening and photographed with provisional identification as an Emperor (*Aptenodytes forsteri*). To avoid the risks of vandalism, dogs or blowing sand, the bird was removed to a place of safety the next morning and there was ample opportunity to study it.

It was certainly in perfect condition with immaculate plumage. The contrast between the mat black head and very pale lemon front with the arresting deep golden auricular patches formed a fitting complement to the clean symmetrical lines of this very handsome bird. The mandibular plates were of a dull rufous red with a little violet towards the tip. The height with the bill horizontal and the neck unextended was 2ft. 9ins. Other points of identification confirmed were flipper markings, feather length and relationship of bill to total skull dimensions.

The bird was not as friendly as some have been described — approach to 5 or 6 feet caused some agitation and sometimes the "interrupted Klaxon" call, while a closer approach still qualified for flippers raised and some very sharp raps. Rivolier (Emperor Penguins, 1956), claims that a full blow from a flipper of a fully grown adult can break an arm. Ross's reference to the excessive stupidity of the birds when captured (A Voyage of Discovery and Research in Southern and Antartic Regions during the years 1839-43, Captain Sir James Clark Ross), seemed hardly to apply to our bird.

Although it was distressed on the journey to Bluff, probably by the confinement and movement, it was still alert enough to find that it could see through the windows of the van and seemed to get some reassurance from this.

Liberation was made half an hour out from Bluff near Dog Island through the kind offices of Mr. R. T. Ballantyne, a Bluff fisherman. When the bird surfaced from his dive off the launch we saw what a really happy Emperor penguin looks like. It splashed, preened, drank and dived with the greatest concentration, leaving one in no doubt as to his favourite element. There we left him. The possibility of a bird having been brought up by a Deep Freeze craft was explored, but no evidence for such an occurrence could be found.

We were grateful to Dr. Bernard Stonehouse, whose work on the species is well known, for confirmation of our identification from a photograph, and for the information that since sub-adults range very widely and as the weight of this bird was 49 lbs. against a range of up to 100 lbs. for the species it was probably a young bird.

From Cook's sightings on the floes approaching the ice barrier in 1773 and Ross's securing specimens in January 1841 on to the present day, the Emperor penguin has captured and held the imagination and interest of naturalists. Skelton's locating the rookery during Scott's "Discovery" Expedition, Edward Wilson's epic winter journey with Bowers and Cherry-Garrard to find the brooding birds and Wilson's reverent and meticulous work on the species match the Emperor's own distinction. With characteristics and associations alike, one meets superlatives on every hand.

Modern work has thrown much light on the biology of the Emperor Penguin; on the mechanism for instance which enables them to brood for over two months without food in temperatures as low as 70 degrees below zero. One wonders why our bird could appear so much at home in Foveaux Strait.

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SHORT NOTE

SPINE-TAILED SWIFTS NEAR KAITAIA

In the late afternoon of 28/11/67 I had a ring from Mr. Malcolm Matthews, a farmer of Awanui Road, some four miles from Kaitaia. He had noticed two strange birds flying about hunting insects in the vicinity of a clump of pine trees. He is quite familiar with the Welcome Swallow (*H. neoxena*) which since it started breeding here just ten years ago is now very common. He described these unknown visitors as being much larger and much faster in flight than Welcome Swallows. I immediately got in my car and he directed me to the spot where he had been watching them. Right enough they were still there.

Such was their speed that it was very difficult to observe their colour accurately. I had my binoculars, but they were useless, although the birds often passed within thirty or forty feet of me. Their speed was like a bullet's and the only times I could catch a glimpse of their colour was when they were flying directly away from me. Their general tone was black; but the base of the tail and possibly a portion of their underparts was white or maybe light buff. This was quite conspicuous. The tail was short and appeared to be square, not forked. The shape of their wings and their flight generally was quite different from that of a Welcome Swallow. They would make long runs, gliding, ascending high without an apparent wing-beat, bank, then swoop; repeating the procedure over and over again. Their wings were swept back like those of a jet-fighter; but were not so pointed as the wings of a Swallow. There was no ducking and diving in short manoeuvres.

By their appearance and behaviour they were Spine-tailed Swifts (*C. caudacuta*). They appeared during a strong E. to N.E. wind which had been blowing for about three days and which continued till the night of the 29th. Mr. Matthews was working nearby and reported that the two swifts were still present. During the night there was heavy rain. They had gone next morning.

—ROSS MICHIE

A SECOND NORTH ISLAND LOCALITY FOR PACHYORNIS ELEPHANTOPUS (OWEN)

R. J. SCARLETT, Canterbury Museum

Some years ago excavations for a road in the Waipukurau area revealed a number of Moa skeletons beneath an accumulation of pumice. I have examined many bones which were recovered from this site. Unfortunately, before scientific work could be done and the birds removed as skeletons, the bones were scattered so that now one deals with odd bones. Among them, however, were many specimens of a *Pachyornis,* far bigger than *Pachyornis mappini* Archey, the larger of the two hitherto recorded for the North Island. *Pachyornis elephantopus* was a very variable bird and in the past was split into several "species" which modern workers regard as invalid.

The Waipukurau bones range from the lower bracket of South Island *elephantopus* to slightly smaller. I had been thinking in terms of a small population of this species migrating across the old Cook Strait land-bridge and remaining as an isolated breeding group in the Waipukurau area. However; on 21 October, 1967, with David and Carol Medway and other members of the Taranaki Caving Club, I was in Skyline Cave, in the Mahoenui district, North Taranaki, and while there we removed a number of scattered moa bones. Among them were two pieces of a right tibio-tarsus encrusted with limestone and mud. After the bones had dried somewhat David sent them to me at Canterbury Museum and, after cleaning, the two pieces were joined to form a complete bone. The break, an old one, is about mid-shaft and joined very nicely. To my surprise it proved to be *Pachyornis elephantopus,* now C.M.AV. 21,480. The measurements are: length 48.6; proximal width 13.6+ (the bone is slightly abraded); mean 4.6; distal width 7.7 c.m. The range of South Island tibio-tarsi of *Pachyornis elephantopus* is from:

	L.61	P.20.3	M.6.1	D.11.3	maximum
to	45.7	14.3	4.3	8.4	minimum

It will be seen that the Skyline Cave bone fits well within this range. It must be stressed that many other factors besides size are used in determining species from odd bones. The tibio-tarsus under consideration is a typical *Pachyornis* in curvature of shaft, of the pronounced "bulge" of the inner surface at the distal end and other features.

The find has already attracted some newspaper publicity but it seems desirable to place such an extension of the range of this species in a scientific journal.

SIGHTINGS OF TATTLERS

(a) PAPANUI INLET

On 9/5/65 Mrs. D. G. Buchanan found a small plain grey wader with some Pied Stilts in Papanui Inlet. It remained in the locality throughout the winter; and was studied there by several observers.

On 4/7/65 I watched it from 30 yards with a 40 x 60 telescope. It was quite tame, returning on one occasion after a dog had put it up. When put up on another occasion it flew off and perched on the only snag visible in the mud of the whole inlet.

A slender bird, it was almost invisible against the mud ripplemarks, moving quickly about in company with three Stilts on one day (it came up to the level of their bellies) and with two or three Pied Oystercatchers and a Bar-tailed Godwit on another day — the Godwit chased it briefly on one occasion. In flight it showed a neat bullet-shaped body with long sharp wings and a small neat tail with the legs not trailing beyond it. On the 4th it called twice in flight, a high sweet "Too-it, tuit" and on the 5th it called once before flying and three times in flight with similar calls well spaced apart. Some calls were double notes and one or two a slurred single note. This would indicate it to be *brevipes* and not *incanus*.

Description: Crown, nape, back, rump and tail an even medium grey with a touch of brown. Wings the same brownish grey both above and below including the axillaries. Coverts very lightly tipped with white and outer primaries showing quite black in flight. Underparts whitish. Flank finely barred with longitudinal bars of brownish grey on the whitish colour of the under parts. Head and breast; black stripe through eye to angle of the bill, whitish superciliary stripe running forward on to the forehead, so that from front on the bird has a neat white V on the forehead, cheeks diagonally streaked with brown, this brownness running down the side of the neck and breast, leaving chin and throat and a narrow line down the mid-breast a whitish colour. Brown of breast runs back to the front angle of the wing and looks quite smooth, no sign of barring. Bill medium length, i.e. not as long in proportion to the head as in Stilt or Godwit, straight, darkish brown, nasal *aperture* a long oval near the base of bill nearly a quarter the length of the bill, nasal *groove* not seen, bill a bit darker at the tip (feeding in mud and so bill could be muddy). Legs quite a bright yellow in some lights, dull horn colour in others, not much of tibia showing below feathering of flanks.

Mr. W. Poppelwell's description of it from brief viewing of it on 5th July. "Back grey with a tinge of brown. Whitish underparts. Across breast very light grey. Bill black. White superciliary streak. Small white V on forehead. White stripe down throat and breast. Legs dull yellow." Mr. G. Chance was trying to photograph it but did note: "Poking bill into mud deeply. Legs looked black. Beak dull pink at base to about half way down and dark tip."

The photographs in British Birds 54: 24-25 agree well for shape, proportion and plumage except for the way the brown on the breast and flank is barred and the lack of white under the chin and down the mid-line of the breast. Since the photographs are of adults at nesting

sites in Siberia, the lack of barring in our Papanui bird may indicate that it is an immature. The fact that it is "summering" here would also indicate this.

The drawing in Condon and McGill "Field Guide to the Waders" is not satisfactory as the shape is too plump compared with both our bird and the photographs in British Birds. Also the white flecking on the wings in non-breeding plumage is not so prominent in our bird but this again may be due to its probable immaturity.

24/7/65. Mr. Chance located the bird at a small sand-spit half way down north side of inlet at full tide. Later it flew up to the head of the inlet when about 30 yards of mud edge was showing, where Mr. Chance again stalked it to photograph it.

I noted that the shading that runs forward on to the breast is quite distinctly darker than the shading along the flank below the line of the wing. It flew a short distance along the edge three times without calling. Each time as it landed it briefly held its wings vertically up as high as possible as if stretching them before folding them — a very graceful movement.

25/7/65. Mr. John Allan found the bird in the same places at the same stages of the tide. He obtained a measurement of the footprint in the mud. The hind toe left a neat hole like a match stick and the full length of this print from the hind toe mark to the front of the longest toe was 32.1 mm. measured with vernier calipers.

— G. HAMEL

(b) TARAWERA RIVERMOUTH, BAY OF PLENTY

On 24/9/66, at the mouth of the Tarawera River, I was watching two Banded Dotterel (*C. bicinctus*) when a larger wader flew past and across to the sandy upper beach on the east side. There it stood facing into a westerly gale, silhouetted against the sea. The long pointed wings with easy springy flight, the elegant shape, the stance and the length of bill were so familiar to me as to leave no doubt in regard to genus. It did not call so the species could not be determined. The general colour, including the underparts, was so dark as to indicate that it could be an Alaskan Wandering Tattler (*Heteroscelus incanus*) having just arrived, still in full or nearly full plumage. The type of habitat was unusual for a Tattler so it may have only just made a landfall. Although the wind was westerly at the time it had just changed from quite a long period of strong north-easterlies which may have influenced its ocean passage to New Zealand.

— H. R. McKENZIE

(c) NEW PLYMOUTH

The recent occurrence of a Grey-tailed Tattler near New Plymouth adds another locality to those known to have been visited by tattlers in New Zealand.

On 26/12/66 Mrs. J. C. Medway, A. F. Barwell, N. Banks and myself noticed a slim and graceful wader feeding alone along the rocky waterline near the mouth of the Waiongona River just north of New Plymouth. At first sight the most noticeable features were the shortish legs and relatively long, straight, black bill. On closer observation the bird showed a uniform brownish-grey colour above

with white below except for the breast where light greyish colouring was noticeable. In certain lights the white superciliary stripe and yellowish legs were visible.

The Tattler allowed approach to within 30 feet at which distance it was closely observed through 16 x 50 binoculars. A bobbing motion of the head was noticed when the bird stood still and on being disturbed it gave a rapid call of 3 or 4 high notes and flew low upstream. This short call, uttered only once, would appear to distinguish the bird seen from the, at times, almost identical Wandering Tattler (*Heteroscelus incanus*).

The Tattler was also noticed by Mr. and Mrs. G. Medway on 31/12/66, but apparently departed after that date, for it was not seen again although a careful search was made on a number of later occasions.

— D. G. MEDWAY

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NEW ZEALAND TATTLER RECORDS

By DAVID G. DAWSON

A sighting by me of a strange wader at the stilt lagoon (near the lighthouse) Kaikoura Peninsula, prompted me to review the New Zealand records of Tattlers. Oliver (1955) lists them as *Tringa incanus* (Wandering Tattler) and *Tringa brevipes* (Grey-rumped Tattler), while the Checklist (1953) lists them as subspecies of *Heteroscelus incanus*. As the two seem to be clearly separable on morphological grounds in the hand if not in the field I will use the former arrangement.

Most sightings have been in the New Zealand spring, summer and early autumn, when these birds are in their "winter" plumage. As is the case with most other arctic migrants some may remain here in the New Zealand winter. If they are adult these birds will be in their "summer" plumage. In this plumage both species show dark grey-brown barring on the undersurface. That of *incanus* is more distinct and extends onto the middle of the abdomen and under-tail coverts, while these areas are white in *brevipes* (Serventy 1944). Two New Zealand sight records mention the "summer" plumage as the criterion used in identification. These are both of *brevipes* (6 and 8). Three records deal with birds that appear to have been juvenile, as they did not show full breeding plumage of either species at a time when adults would be expected to. These are: 16 (17/7/60), 19 (13/5/61), and 21 (25/5/62), in the table.

In the "winter" plumage these two species are most difficult to distinguish. Three criteria have been suggested by New Zealand observers to aid in their identification at this time (our summer).

The first is a difference in habitat preference. This was never considered to be a diagnostic feature. The difference was first suggested by Brathwaite (1955). Sibson (*pers. comm.*) thinks that *incanus* is seldom, if ever, far from the tideline, and an inland Tattler is *more likely* to be *brevipes*. In Fiji, *incanus* may go some way inland up the bigger rivers.

RECORDS OF TATTLERS

References are to Notornis

1. Portland Island: two shot, 1883. Buller (1888).
2. Raoul Island: one shot ("summer" plumage), 1913. Oliver (1955).
3. Kawakawa: one, Aug. '48 to Dec. '50. (6: 111).
4. Parengarenga: six, 13/2/50 to end of Mar. '51 (4: 122-134).
5. Parengarenga: two, 10/1/51 to 26/3/51. (4: 122-134).
6. Parengarenga: three plus, 3 to 6/4/53. (5: 227).
7. Ahuriri Lagoon: one, 16/11/53. (6: 145-150).
8. Manukau: one, 25/4/55 to 7/5/55. (6: 243-244).
9. Manukau: one, 5/11/55 & 3/12/55. (6: 243-244 & 7: 92).
10. Manukau: one, 1/2/57 to 18/4/57. (7: 203).
11. Manukau: one, 29/10/57 to 20/4/58. (8: 87).
12. Farewell Spit: one, Mar. '58. (10: 58).
13. Manukau: one, throughout summer up to 26/4/59. (8: 224).
14. Kuaotunu Beach: one, Feb. '60. (9: 76).
15. Muriwai Lagoon (Gisborne): one: 13/3/60. (9: 76).
16. Heathcote-Avon estuary: one, 17/7/60 & 10/1/61. (9: 135-136).
17. Waikanae estuary: one, 1/10/60 to 22/4/61. (10: 67-72).
18. Greenpark Huts: one, 25/3/61. (9: 243).
19. Aramoana (Otago Harbour): one, 13/5/61. (9: 181).
20. Chatham Island: one (B. D. Bell in litt.)
21. Farewell Spit: one, 24 & 25/5/62. (10: 58).
22. Farewell Spit: one, 19/9/62. (10: 224).
23. Black Reef: one, 10/11/62. (10: 188).
24. Port Jackson (Coromandel): one, 21/12/62 to 1/1/63. (10: 236).
25. Ahuriri Lagoon: one, 13/1/63 to early Feb. '63. (10: 237).
26. L. Tuakitoto (Kaitangata): one, 2/2/63 to 10/2/63. (10: 237-238).
27. Manukau: one, 22/11/63 to 27/1/64. (14: 35-36).
28. Waitakaruru, F.o.T.: one, 3/3/64. Miss A. Goodwin.
29. Mairetahi, Kaipara: one, 16/3/64. (12: 79).
30. Farewell Spit: three, 6/4/65. (13: 105).
31. Papanui Inlet: one, 9/5/65 to 25/7/65.
32. Kaikoura Peninsula: one, 10/5/65. (This paper).
33. Tarawera Rivermouth, B.o.P.: one, 24/9/66.
34. Waiongona rivermouth, New Plymouth: 26/12/66 to 31/12/66.
35. Farewell Spit: four, Jan. 1967. (14: 177).
36. Chatham Islands: one, 1967. (B. D. Bell in litt.).

The second criterion is the relative length of the nasal groove on the bill: in *brevipes* it ends "sharply exactly half-way along the upper mandible, . . . not tapering to two-thirds of the way along the bill as in *H. i. incanus*." (Andrew 1962). Serventy (1944) has shown this character holds for a sample of five *incanus* and twenty-seven *brevipes* specimens collected in Australia. This character is difficult to see in the field and only three New Zealand records claim identification based upon it. These are 3 and 22 for *incanus* and 17 for *brevipes*.

The third criterion for the identification of birds in "winter" plumage is the call. That of *incanus* is usually of several syllables (Hindwood and Hoskin 1954 and Sibson 1965). That of *brevipes* is normally given as a double note: "too-weet" (Hindwood and Hoskin 1954). No doubt this distinction usually holds, but shorter

calls are recorded for *incanus:* "a sweet clear whistle of four even notes closely run together" given "except once, . . . on numerous occasions and at all seasons" (McKenzie 1949 & 1955), while longer ones are recorded for *brevipes:* "peeep-peeep-pip-pip-peep" (Keast quoted in Turbott 1951), "too-too-too somewhat slurred and all on the same pitch" (Andrew 1962). It is clear that *incanus* can give short calls and *brevipes* long ones. Our knowledge of the calls of these two is based upon few birds of known identity and little is known of possible age, sex, or seasonal differences. Thus identification cannot be based on the calls, at least until we have more information on the calls of birds of known identity. Records 4, 5, 9, 10, 11, 13, 16, 19, 20, 21, 24 and 25 rely upon the call for identification and must be considered identified only as Tattlers and not to species. All except 23 and 24 were considered *brevipes* by their authors.

Three records are of birds shot. Record 1 is of a pair shot in autumn. The description of the male identifies it as *incanus* in "summer" plumage, but that of the female could apply to either species. These skins are not in New Zealand (F. C. Kinsky *pers. comm.*). Record 2 is of a "specimen in summer plumage shot at Raoul Island . . ." and is considered to be *incanus* by Oliver. I have not found any indication that a skin was ever made of this bird.

The rest (7, 12, 14, 15, 18, 26, 29 and 32) are not considered identified to species by their authors.

Another criterion that has been suggested for distinguishing these two species is the rump colour. In *brevipes* there is a wide white barring on the upper tail coverts, while in *incanus* these bars are very narrow (Serventy 1944, Witherby *et al.* 1943); however Bull (1948) notes these bars may be worn and Andrew (1962) found them inconspicuous on a newly moulted bird. It seems this criterion is useful only on a skin (but see below).

Record 32 is the one that prompted this review. I watched the bird from a distance of about five to ten yards for an hour as it fed wading in the shallows with four Pied Stilts (*Himantopus leucocephalus*). Though unaided vision was used, my field notes and sketches identify the bird as a Tattler, uniform grey upperparts and pale-yellow legs being among the key points noted. Mr. D. H. Brathwaite independently came to the same conclusion on examining my notes. I recorded the call as "a single whistle, wavering in pitch." This description is perhaps nearer to the traditional one for *brevipes,* which is sometimes said to be slurred into one note, but my notes do not place the call clearly in either of the traditional categories. Though I noted "lighter rump" I feel this is not sufficient to be sure the bird was *brevipes.* This character would deserve more attention. Like records 16, 19 and 21, my bird was probably a juvenile. It is of note that all such late records of juveniles are from the South Island.

It is to the credit of New Zealand observers that seven records of this difficult pair are detailed enough to be sure of the specific rank (1, 2, 3 and 23 *incanus* and 6, 8 and 13 *brevipes*). The other sight records can at present be considered only as Tattlers, though there is reason to suspect most are records of *brevipes.* There is need for more careful study of calls and plumages along the lines of that reported by Andrew (1962) on the Waikanae *brevipes.*

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SHORT NOTES

SPINE-TAILED SWIFTS OVER KAIPARA FLATS

On 21/11/67, a calm day, after recent northerly gales and rain, I was on a 600-foot hill-top on my farm at Kaipara Flats near Warkworth. The weather was generally dull with showers and occasional thunderstorms; but at 2.30 p.m. when the hill was bathed in warm sunshine, I became aware of the presence of six strange birds, darting and circling at incredible speeds, when one began repeatedly diving at me. They flew about the knoll for about half an hour during which time they "buzzed" me and the dogs frequently. Their speed was such that at close range the eye could not focus nor register much detail. Almost instantly they would be too distant for me to observe the smaller markings.

Their flight was remarkable in that there was very little wing-beating for the speeds maintained and they seldom went where expected. They could glide in a circle of about five chains in diameter with rigid wings and not lose height or speed. It seemed they were jet-propelled. No vocal sounds were heard; only a whistling swish as they rocketed by.

Against the sky, dark colouring predominated; but when they were seen from above, a greenish brown on the head and back was visible. At a certain angle to the sun a reddish purple glint would appear. A wide dirty white bar crossing the under-tail coverts and just showing on the lower back was dull and in contrast to the irridescence of the rest of the plumage. The wings were long and narrow at the tips and curved back evenly as though to form a fifth part of a circle. The short square tail was not forked. The head was blunt and rounded. I was unable to see sufficient of the eyes, bill or legs to warrant description.

The birds finally left the hill and began to climb, still circling and flying at a fantastic speed. A three-knot breeze carried them slowly to the south-east but they disappeared from sheer height.

On consulting "Oliver's Birds of N.Z." I decided that they were "Spine Tailed Swifts" (*Chaetura caudacuta*).

— F. P. HUDSON

GIANT PETRELS IN LYTTELTON HARBOUR

Over the months of October - November Lyttelton Harbour supports a somewhat static number of about thirty Giant Petrels (*M. giganteus*); but I cannot tell if they are the same birds day after day.

Eight years ago (1959) a bird of the white phase appeared in the harbour and was recorded on one day only. On 17/10/67 a similar bird was seen among a group of brown birds, but did not appear the next day or on any day since. These two white birds are the only ones I have seen in Lyttelton Harbour over twelve years.

I have come to the conclusion that our local Nellies are just passing through, staying only a day or two and then moving south; and that at this season they are replaced by about the same number each day. The Lyttelton Nellies normally arrive in the harbour, after following the inter-island steamer in from sea in the early morning.

On 13/10/67 I witnessed a group of Nellies seize a Black-backed Gull (*L. dominicanus*) that had moved too close to the offal on which they were feeding; and literally tear it apart. I have received several reports of similar incidents. I have also seen a Black-backed Gull catch and swallow a Housesparrow.

— B. N. NORRIS

[In "A Naturalist's Voyage Round the World," Darwin writes: "At Port St. Julian (Patagonia), these great petrels were seen killing and devouring young gulls." — Ed.]

★

CATTLE EGRETS IN NORTHLAND

Two Cattle Egrets (*Bubulcus ibis*) spent the whole winter of 1966 on the farm of Mrs. F. Atkins, some three miles from Kaitaia. Mrs. Atkins had a paddock in which two bulls were kept. They being heavy animals and the ground rather soft, worms would come to the surface wherever the bulls walked, and made easy picking for the egrets. Sometimes when one of the bulls would lie down an egret would perch on it. The egrets disappeared in the spring and did not return for the winter of 1967.

— ROSS MICHIE

[Cattle Egrets have now been reported sporadically almost from one end of New Zealand to the other. In April 1967 one was found at Port Adventure, Stewart Island. — Ed.]

★

WRYBILLS IN SOUTHLAND

From the sketchy evidence available it seems likely that a few Wrybills (*A. frontalis*) find their way to the coast of Southland almost annually; but only long term observation will reveal the pattern.

The following sightings have been made:—

1962: 1 in February at Waimatuku rivermouth.
1965: 3 on 2 October at Waituna lagoon in breeding plumage.
1966: 1 in February near Waimatuku rivermouth, among Banded Dotterels on turnip ground.
1967: 1 on 10 October at Invercargill estuary; and 3 on Oreti Beach. About a week later four were seen on Oreti Beach all in breeding plumage.

The nearest known breeding ground is about 150 miles northeast.

— ROGER SUTTON

SIGHTINGS OF WHITE-WINGED BLACK TERNS (*C. leucopterus*) IN THE SOUTH ISLAND

(a) On 16/11/63 I had just finished banding at a colony of Black-billed Gulls (*L. bulleri*) on the Wairau River near Blenheim, when a distinctive looking bird appeared following a river channel. The light was just starting to fade about 7.00 p.m. but the contrast between the white wings and the black body was very noticeable. The flight was that of a tern but the bird seemed faster and more active and it soon disappeared up the river. Five days later, again after banding on the same site at 7.15 p.m., I saw what was probably the same bird and felt sure of its identity from a description given by Mr. Brian Bell.

(b) When visiting an unsuccessful colony of Black-billed Gulls on the Wairau River I saw a White-winged Black Tern at 2.00 p.m. on 27/11/65. It was a sunny day with a strong wind and in the vicinity were a few representatives of all the usual river-bed birds. The new-comer flew rather fast and high — 60 - 80 feet above the river — but had the distinctive tern flight and looked slightly plumper than a Black-fronted Tern (*C. albostriatus*). The head and body were black with a white rump and tail. Upper wing surface was light grey similar to that of the Black-billed Gull, while the underside was white with a darker band along the leading edge. I was unable to distinguish the colour of the bill so it may have been dark. The bird circled once and flew on upstream.

— J. A. COWIE

(c) Ki-Wainono is a shallow lagoon four miles east of Waimate, South Canterbury. On 27/8/67 this lagoon was visited and two White-winged Black Terns (*Chlidonias leucopterus*) were observed in breeding plumage.

The birds appeared to be hawking insects along a stretch of marshy ground near the lake edge. Through binoculars, at a distance of fifty yards, they appeared to be similar in size to the Black-fronted Tern (*C. albostriatus*). They had a most conspicuous white tail and rump, and a black body; the upper surface of the wings was a uniform silver-grey, whereas the underwing was patchy black and dark grey. The bill, legs and feet were dark.

The birds, whose plumage gave a beautiful contrast of black and white, were observed for an hour, during which time they were not seen to land. They were also observed by Mr. M. Keillor of Studholme on 28/8/67 but were not seen when he visited the lagoon on 25/9/67.

— B. R. KEELEY
P. M. SAGAR

★

WELCOME SWALLOWS IN THE FAR NORTH

While bone-collecting at Tom Bowling Bay and Waikuku Beach, Northland, from 14 to 17 February 1968, Mr. Jack Grant-Mackie and I enjoyed the hospitality of Mr. Carl Nilsson, of the Mokoikoi Block, Waikuku Beach. His house is about a mile in a direct line from North Cape. Mr. Nilsson, who is a friend of birds and animals, pointed out a nest of Welcome Swallows on his back wall, under the eaves, and several of these delightful birds were seen flying nearby. This is probably the most northerly nesting record of the Welcome Swallow in New Zealand.

— R. J. SCARLETT

REVIEWS

Handbook of the Birds of New Guinea by Austin L. Rand and E. Thomas Gilliard. Weidenfeld and Nicholson, London, 1967; pp. 1-612; 76 plates of black and white illustrations and 5 colour plates.

Dr. Rand is Chief Curator of Zoology in the Field Museum, Chicago, and the late Dr. Gilliard (he died on 27 January, 1965) was Associate Curator of Birds at the American Museum of Natural History, New York. Between them they have produced a fine and very useful book.

After a brief introduction and explanation of the plan of the work there is a synopsis of the Orders of the New Guinea species, followed by a map, general information on New Guinea, climate, altitudinal zonation, etc., and then the main body of the book. The plan is to describe each family followed by a description and brief account of the habits of the species and subspecies in each family. Surprisingly little is known of the life-history of many New Guinea birds. I notice an occasional misprint, e.g. Cosmerodius for Casmerodius on p. 34. There are some surprising bits of information. How many New Zealand ornithologists knew Wilson's Storm Petrel reached New Guinea? Possibly everyone but this ignorant reviewer; but I doubt it.

The black and white illustrations by Douglas E. Tibbitts are adequate and competent; those by Albert E. Gilbert are superb, as are his colour plates, although I do not like the pale green background used for a couple of them.

This is an indispensable book. I wish I had had it when in New Guinea last year and shall certainly take it on any future trip even though, of necessity, the bulk is a little much for carrying in the field.

—R.J.S.

★

Nature Walkabout by Vincent Serventy, A. H. & A. W. Reed, 1967, $3.75.

To ornithologists in Australia and the Pacific the name of Serventy is a household word. Now in "Nature Walkabout" we have a vivid account, from a younger member of the clan, of a migration which he and his wife and children made from Perth to Sydney by way of the north. Vincent and Carol Serventy are expert photographers and give their readers — who will be many — an appetising sample from the infinite variety of wildlife and scenery in Australia's vast teeming continent. Aboriginal man, marsupials, birds, reptiles, flowers, rock formations, billabongs, all are pictured and excellently reproduced in colour. The text is direct and evocative. "Townsville's residents are lucky to have at their front door a huge stretch of common land on which thousands of brolgas feed and dance."

This is just the book to offer as a parting gift to the dedicated naturalist with itchy feet who is setting off to enjoy the unique and exciting wonderland of New Zealand's gigantic neighbour.

— R.B.S.

Know Your New Zealand Birds, by K. E. Westerskov. Whitcombe & Tombs Ltd. $2.25.

Here is another small plank to be added to the rapidly growing edifice of the ornithological literature of New Zealand. Dr. Kaj Westerskov has a background of European experience which has helped him to obtain a very full grasp of the study of birds in New Zealand in a short time. Any student of birds in this country, having absorbed the advice in this book, should have become quite an expert.

Identification is lavishly provided for by the sections named "Quick Reference," "Field Key," "Bird Identification According to Habitat" in its ten sub-sections and "Identification to Species." The further sections on various lines of practical study are all useful. A sample of these is the very practical advice for the winning of Scout and Guide badges. A "Personal Checklist" has its dangers in that it could lead students to become "Life listers," considered by serious ornithologists to be next to the egg collector, but here the author has put this facet in a sensible manner which should not lead anyone astray. But why is *Stiltia isabella* retained?

The pictures from Buller by his artist Keulemans are an ornament to any book but in this small volume they may be felt to be rather heavy. The photos are "real life" ones and do much to bring further lively interest to the subject matter. The bibliography, though stated by the author to be a selection only, is comprehensive and will be very helpful to the serious seeker after knowledge.

— H.R.McK.

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NOTICES

CRESTED GREBE SURVEY

The Southern Crested Grebe (*Podiceps cristatus australis*) is found in the South Island only and is confined to a relatively few high country lakes and some lowland waters in Westland.

A study of the present distribution and population size of this species is being carried out on a research grant from the University Grants Committee. Would any member who has observations of present and past occurrences of Crested Grebes and is willing to co-operate, please communicate with the undersigned from whom specially designed questionnaires can be obtained. Field work has been carried out in the southern half of the South Island and will be extended into Nelson-Marlborough during the 1967-68 summer. Information is particularly sought from small and out of the way (alpine) lakes.

Please send all relevant information or write for questionnaires to:

Dr. K. E. Westerskov, Department of Zoology, University of Otago, Dunedin.

1969 SUMMER STUDY COURSE

A study course will be held at Invercargill from January 17th to 24th, 1969. Accommodation has been arranged at Omaui Camp, near Bluff, and there is promise of a very attractive programme covering Awarua Bay and Oreti Estuary. Full details will be advised in the June issue of "*Notornis*."

LETTER

The Editor.
Sir,

SADDLEBACK NUMBERS ON HEN ISLAND

Having spent numerous periods on Hen Island since 1957, during which the distribution of Saddleback in various parts of the island has been closely observed, I feel competent to comment upon previous assessments of total numbers, and in particular to correct the impression of an abounding population given in *Notornis* XI, 176-181. The figure of 800 to 1000+ pairs in these pages is much in excess of other recorded estimates. I cannot think that numbers would fluctuate violently from year to year, or over a number of years.

An estimate of 300 birds was made in 1925, but only a small portion of the island was covered. In a more careful estimate made by Turbott *et al.* in 1939, they arrived at a total of "probably about 200 pairs" (*Emu* 40, 158-161).

In January, 1968, two parties organised by Graham Adams of Wildlife Service covered approximately one third of Hen, including some of the best habitat, and obtained sight records of 47 pairs, or their equivalent in single birds. This would mean sight records of about 140 pairs for the whole island, and would probably account for about half the total population, so that 280 pairs in all would be a fair estimate. Subsequent extensive transects and trips during mist-netting operations confirmed the estimate of sight records being about half the total numbers. On the whole of the eastern side of the island there are large areas of doubtful habitat, with a few obviously suitable areas, where fair populations were observed.

Mr. Ian Rowley of C.S.I.R.O. Research Section, Canberra, was with us for the final three days in Jan./Feb. 1968, during which time he travelled the island extensively. He expressed the view that the total population does not exceed 300 pairs, and his expert opinion goes far to confirm our own ideas.

It is comforting to see a flourishing population on Red Mercury Island resulting from a liberation of 32 birds in 1966, and on Middle Chicken from a release of 23 in 1964. On this latter island a day was spent in January last when about half the island, certainly the better half, was carefully combed. Sixty birds were observed, so that the total population is between 90 and 120. If the substantial transfers made this year to Cuvier and Fanal Islands prove successful, the future of the North Island race of the Saddleback should be well assured.

— A. BLACKBURN

LIST OF REGIONAL REPRESENTATIVES, 1967/68

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The following are available on order from Mrs. H. R. McKenzie, Box 45, Clevedon:

Back Numbers of Notornis at 50c each. Large orders for full or part sets at special prices.

O.S.N.Z. Library Catalogue, 70 pp., 50c.

Banding Reports, Nos. 8 to 14, 50c each. Nos. 1 to 7 are incorporated in early issues of 'Notornis.'

Kermadecs Expedition, 1964, by A. T. Edgar. Reprints at 45c.

From all bookshops:

A Field Guide to the Birds of New Zealand, by R. A. Falla, R. B. Sibson and E. G. Turbott. $4.50.

From O.S.N.Z., Box 40-272, Upper Hutt:

A Biology of Birds, by B. D. Heather. $1.33 post free.

A Field Guide to the Waders, by Condon and McGill. 65c.

NOTICE TO CONTRIBUTORS

Contributions should be type-written, double- or treble-spaced, with a wide margin, on one side of the paper only. They should be addressed to the Editor, and are accepted on condition that sole publication is being offered in the first instance to "Notornis." They should be concise, avoid repetition of facts already published, and should take full account of previous literature on the subject matter. The use of an appendix is recommended in certain cases where details and tables are preferably transferred out of the text. Long contributions should be provided with a brief summary at the start.

Reprints: Twenty-five off-prints will be supplied free to authors, other than of Short Notes. When additional copies are required, these will be produced as reprints, and the whole number will be charged to the author by the printers. Arrangements for such reprints must be made directly between the author and the printers, Te Rau Press Ltd., P.O. Box 195, Gisborne, prior to publication.

Tables: Lengthy and/or intricate tables will usually be reproduced photographically, so that every care should be taken that copy is correct in the first instance. The necessity to produce a second photographic plate could delay publication, and the author may be called upon to meet the additional cost.

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Nomenclature: Contributors should follow the Checklist of N.Z. Birds for both the scientific and vernacular names. Scientific names of species and genera are printed in italics, and in the script should be underlined; and the specific or subspecific name should be enclosed in brackets if following the vernacular name, thus: Stewart Island Kiwi (Apteryx australis lawryi). It is necessary to give the scientific name as well as the vernacular the first time the latter is mentioned, but thereafter only one of the names. Capital letters should be used for vernacular names.

References: If listed, these should be in the form of the following examples:

1. Atkinson, I. A. E., 1964: Feeding stations and food of the North Island Saddleback in August. Notornis 11, 2, 93-97.

2. Buller, W. L., 1888: A History of the Birds of New Zealand (2nd ed.) 2 vols., the author, London.

The references should be serially numbered, and in the text, should be shown thus: Atkinson 1964 (1), and Buller 1888 (2). If references are cited in the text, the following shortened form may be used: Atkinson 1964, Notornis 11, 2: 93-97.

Publication: Contributions will normally be published approximately in the order in which they are received by the Editor, but at his discretion. He may seek the opinion of the Editorial Committee, appointed by the Council of the Society, on any matter including the general suitability of the contribution for publication.

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