

the flesh being: Wing 180 mm., Tail 66 (total), Tarsus 32, Middle toe and claw 25, Culmen 14.5.

On first consideration this appears to be a new record for New Zealand, but it has prompted a re-examination of the evidence for the inclusion of the Australian Pratincole (*Stiltia isabella*), first recorded by Buller (1898), with further elaboration in 1905, and since repeated in all published lists of New Zealand birds. Buller was advised of the securing of the specimen at Westport by Mr. William Townson, and it is clear from the text of Townson's letter quoted by Buller that the bird was in fact *Glareola maldivarum* and not *Stiltia isabella*. "Black line bordering the buff-coloured throat" and the "scarlet margin to the gape" are clear enough to be completely diagnostic. This means that the Australian Pratincole must be expunged from the New Zealand list and the Oriental Pratincole substituted with two records as far apart as 1898 and 1959. It is interesting, however, to note the additional comment by Townson that he heard of a party of five being seen on the beach at Westport a few days after the shooting of the 1898 specimen.

These occurrences are another interesting example of the drift to New Zealand of Asiatic breeding birds migrating regularly to Australia. Most of the high-flying insect-hawking forms common in Australia during the southern summer have now been recorded intermittently in New Zealand.



NARRATIVE OF A VISIT TO THE NEWLY-DISCOVERED EMPEROR PENGUIN ROOKERY AT COULMAN ISLAND, ROSS SEA, ANARCTICA

By H. J. HARRINGTON

DISCOVERY OF THE ROOKERY

The New Zealand Geological and Survey Antarctic Expedition of twelve men left Port Lyttelton on the heavily-laden ice-breaker U.S.S. *Staten Island* on 22nd November, 1958. After a very stormy passage and slow progress in difficult pack-ice a rendezvous was made with the ice-breaker U.S.S. *Glacier* near the south end of Coulman Island on 6th December.

It was planned that the New Zealand expedition would be landed in two parties in the vicinity of Terra Nova Bay and Wood Bay. The ice-breaker U.S.S. *Glacier*, carrying Captain E. S. McDonald, Deputy-Commander, U.S. Naval Support Force, Antarctica, was to assist in the landing operation. The *Glacier*, which was already in Antarctic waters, left McMurdo Sound a day after the *Staten Island* left Lyttelton to reconnoitre landing sites and helicopter flying conditions in the Terra Nova Bay district. At Terra Nova Bay a wide lead was found extending northwards and was followed to Coulman Island, where the ship waited several days for the *Staten Island*. During the waiting period a helicopter was flown over the summit of the island near its southern

end. Another helicopter was flown around the island photographing its shores, and the pilot discovered a large Emperor Penguin rookery on the sea-ice near the north-west corner of the island. Two United States biologists who were passengers on the U.S.S. *Glacier*, Messrs. John Dearborn and Hugh Dewitt, were flown to the rookery, and spent about an hour there. They estimated that the population, very roughly, was about 33,000 breeding pairs (pers. comm.). It is apparently the tenth Emperor Penguin rookery to be found, and one of the largest. The discovery caused considerable excitement, and news of it was obtained from Captain McDonald when he flew to the U.S.S. *Staten Island* from the U.S.S. *Glacier* on 6th December.

SECOND VISIT

Permission was given for a party of six men to fly to the rookery that evening from the *Staten Island* to do about twelve hours' work, while the ship moved slowly through pressured pack-ice towards the U.S.S. *Glacier*. The party consisted of Dr. W. Sladen, a British medical officer and biologist who had studied penguins for two years with the Falkland Islands Dependencies Survey, the United States biologist, R. Penney, who was en route to Wilkes Station to study the Emperor Penguins there; the British medical officer and physiologist Dr. R. Goldsmith; the ship's photographer, J. Premzic; and the New Zealanders, E. B. Fitzgerald and the writer. The rookery was circled several times by the helicopter so that Premzic could take photographs, and the party was then landed in two flights at 9 p.m. Work started immediately, with the biologists and photographer banding and observing the birds, while Fitzgerald and the writer commenced a survey and census of the rookery, and made a hasty examination of the geology of the adjacent cliffs. At "mid-night" snow began to fall and at 9 a.m. the following morning development of a storm made further work impossible. Fortunately, we had with us an emergency two-man tent, food, fuel and cooking equipment, and were able to shelter in reasonable comfort despite a lack of ground-insulation and crowding. (The bottom layer of men in the tent became quite lyrical at times in demanding a reversal of positions with the upper layer.) Our only real worry was that the ship's officers might be unduly concerned about our safety, and in fact two attempts to fly helicopters to the camp were made shortly before the storm had eased completely. The weather cleared on the afternoon of 8th December, and work had just restarted at 3 p.m. when two helicopters arrived from the ice-breakers and the party was returned hastily to the ships.

OBSERVATIONAL RESULTS

Coulman Island is a pear-shaped basaltic dome elongated in a meridional direction. It is 19 miles long, 8 miles wide at its southern end, and 4 miles wide at its northern end, which is called Cape Wadworth. At its larger southern end the dome is surmounted by a large ice-filled crater and tuff-ring rising to 7,500ft., but the greater part of the island is covered by an ice-cap flowing to very steep sea-cliffs 1000ft. to 3000ft. high, which completely surround the island. The penguin rookery is distributed over sea-ice for half a mile to two miles from the base of the cliffs on the west side of the island about 2 miles south of Cape Wadworth.

Snow-covered sea-ice completely filled the channel between Coulman Island and the terminal face of the Lady Newnes Ice Shelf 20 miles to the west, and ended to the north on a line from Cape Wadworth to Cape Jones, which is the nearest point on the mainland 8 miles to the north-west. This large continuous area of ice was dotted with bergs broken from the ice shelf in the previous summer, but was unbroken by leads, except near the junction with the Lady Newnes Ice Shelf, where many seals, presumably Weddell Seals, were lying beside a few narrow cracks several miles long. An area of open water extending for 10 miles or more north of the line joining Cape Wadworth and Cape Jones was the feeding area for the Emperor Penguins, and the food supply in it must be very large for no Emperor Penguins were observed foraging further afield among the sea-ice and open leads to the east and north.

The penguin rookery lay 2 to 3 miles south of the sea-ice edge, and the birds were not distributed haphazardly but in a series of fairly distinct arcs or irregular loops. Each arc consisted of dense clusters of birds (creches) linked by thinner lines of birds moving to and from along the length of the arc. There was no traffic radially from one arc to another. The base of the innermost and smallest arc was surveyed by theodolite and chain, was a mile long and was half-a-mile from the foot of the cliffs of Coulman Island. A second arc looped outwards from the extremities of the inner arc, and further arcs and loops of birds extended outwards more irregularly and less distinctly for 2 to 3 miles. The position of the inner-most arc can be explained because it marked the edge of an area of knee-deep soft snow extending leeward from the cliffs of the island. Probably also, the birds do not congregate closer to the cliffs because of the risks of ice and snow avalanches. The pattern of outer arcs and loops was not so clearly related to the occurrence of patches of soft snow, but was possibly more directly related to broad low undulations and pressure waves in the sea-ice. The lighting during our visit unfortunately approached "white-out" conditions, so that the occurrence of pressure waves could not be verified by eye, but it seems possible that the birds were congregating on the crests of broad low pressure waves up to two feet high in the same way as Adelie Penguins congregate on beach hummocks and ridges at their nesting sites.

At several places the thickness of the firm snow cover over hard sea-ice was found to be about 30 inches and layers of droppings and snow crusts compacted by the birds occurred within it at intervals of a few inches. This indicates that half-a-dozen storms occurred during the nesting season, and it is possible that Emperor Penguins require nesting areas where snow accumulates during storms, rather than areas where snow is removed by wind. Certainly during the storm that we encountered the birds clustered together more closely, and the chicks were almost completely buried by snow, only their beaks being visible. The heads of the adults were showing, when raised. Probably the chicks could easily keep warm beneath the blanket of snow, whereas they might freeze if exposed to prolonged high winds, and this protection is probably most important after the chicks reach the creche stage, especially if both parents are away feeding when a storm occurs. As we left the rookery the adults and some chicks were surfacing and long lines of adults were forming and moving head to tail towards the sea for feeding.

On the soft new surface they were all sledging and not walking.

Before the storm the inner arc of birds was surveyed by theodolite and chain, and the second arc was surveyed by pace and compass methods. The number of chicks in representative creches along each arc was counted. By multiplication and crude estimates of the size of the remaining arcs the population of chicks in the whole rookery was estimated as 50,000, thus agreeing as well as can be expected with the snap estimate of 33,000 breeding pairs made by Dearborn and Dewitt. In several creches the numbers of adult birds and chicks were counted, and the percentage of chicks ranged from 80 per cent. to 90 per cent. of the total at different sites.

About 200 chicks at the northern end of the second arc were banded on the flippers by the biologists. Goldsmith also measured the body temperatures of chicks by causing them to swallow minute thermocouple thermometers and connecting wires, which they did without apparent injury, or even interest in the activity. One chick was killed for food, and its stomach contents were examined by Sladen. Several chicks and adults were collected and taken to the U.S.S. *Staten Island* for further studies, being hand-fed by Sladen, Penney and Goldsmith. After voyaging around the Ross Sea the chicks were changing to adult plumage and were thriving when we last heard of their progress several weeks later.

Several Adelie Penguins were noticed wandering in a lively and aimless manner in the rookery before the storm, and their reaction to the regally impassive Emperor chicks was very amusing. One Adelie in particular for a long time tried to jump above the level of an Emperor chick's head, at the top of each jump uttering a belligerent "arrk," but was quite ignored by the chick, which merely stared at the horizon in a meditative way.

After the party returned to the ice-breakers, attempts were made to obtain a more accurate census of the population of the rookery. A helicopter was fitted with an aerial camera, and made a flight over the rookery to take vertical aerial photographs. Fitzgerald assembled the photographs, but found that the runs did not overlap, and that they covered only part of the rookery so that they were unsatisfactory for census purposes. Later, at McMurdo Sound, arrangements were made for vertical aerial photographs to be taken by a P2V Neptune photo-reconnaissance aircraft on a flight from McMurdo to Hallett Station and the Tucker Glacier on 4th January, 1959. However, no photographs could be taken, the pilots and other observers reporting that open water extended from Coulman Island to the Lady Newnes Ice Shelf, and that the rookery had disappeared.

COMMENTS ON FURTHER WORK

It is inevitable that biologists will attempt more extended work at this rookery, but it will be difficult to achieve, and great caution should be exercised in planning it. Access by sea during the breeding season is possible only by ice-breaker, and the fact that during our visit the U.S.S. *Glacier*, the most powerful and modern ice-breaker in the western world, damaged both propellers so severely that it had to return to Wellington for their replacement, is a measure of the difficulty of approach by sea. Several ships, including two ice-breakers, have been damaged

in the last few seasons in the heavy pack-ice on the Coulman Island-Cape Hallett coast. An approach overland or by sea from the McMurdo Sound district is impracticable, if not impossible. An approach from Hallett Station along the coastal sea-ice would be very difficult because the sea-ice in that region is in a chaotically pressure-ridged state, the ridges being closely spaced, and rising commonly to more than 12ft. in height. In that type of terrain it would be foolhardy to attempt to use over-snow motor vehicles. Borchgrevink, in the spring of 1900, attempted to sledge down the coast from Cape Adare to the Possession Islands over similar sea-ice with dog teams, and found progress almost impossible. Even if dog teams succeeded in getting south from Cape Hallett, it would probably be found that access to the rookery was cut off by the area of open water between Coulman Island and Cape Jones which probably opens every year quite early in the breeding season. A determined and experienced party might be able to take dog teams overland from Cape Hallett via Football Saddle and the Whitehall Glacier. In the 1957-58 season the writer travelled over part of this route, and observed that it would be difficult to take sledges over the lower northern end of Whitehall Glacier where it joins Tucker Glacier. The use of dog teams near a penguin rookery is of course not to be encouraged for obvious reasons. Essentially the most practicable means of approach is by air, using R4D aircraft from McMurdo, or alternatively Otter aircraft or large helicopters from Hallett Station, but air approach would have hazards that might not be accepted by pilots and others, and would not put biologists in the field at the start of the breeding season in winter. If a party does succeed in getting to the rookery for an extended period of work, it will face problems in establishing a secure camp until it can be removed by sea later in the season, or until it can return overland to Hallett Station via the Whitehall Glacier. The rookery extends westwards from the cliffs of Coulman Island. The cliffs are steep, and at their base there are only short narrow stretches of "beach" which consist of steep cones of rock that have fallen from the cliffs and avalanche chutes above. All beaches were apparently menaced by avalanches from ice bluffs at the tops of the cliffs and no suitable camping area was noticed. In fact geological work on the cliffs was done very rapidly after we noticed one of them swept by a large ice avalanche a few minutes after we landed. A suitable camping area could be found however, on snow slopes to the west and south of Cape Jones, 6 to 7 miles from the rookery. It should be noticed also that the sea ice at the rookery had disappeared when a P2V aircraft reconnoitred the area on 4th January. It would seem that brief visits might be possible at times on an opportunist basis, but that attempts to do extended work are unjustified at present, especially as many of the biological problems can be studied more easily at Wilkes Station, or at Cape Crozier. There is a possibility of building a hut at Cape Crozier to provide a winter base for studying both the Emperor and Adelie Penguin rookeries there (as Dr. E. A. Wilson intended to do on Scott's second expedition).

OTHER EMPEROR PENGUIN ROOKERIES IN THE ROSS SEA

The rookery at Cape Crozier was studied by Dr. E. A. Wilson during the two Scott expeditions early in this century.

Captain J. Cadwallader of the U.S. Naval Support Force informed

me that a group of roughly 100 Emperor Penguins had been noticed on the sea-ice as the U.S.S. *Glacier* passed Cape Washington and the entrance to Wood Bay en route to Coulman Island, late in November, 1958. He agreed that this might indicate that there is an Emperor Penguin rookery in the vicinity of Wood Bay, in addition to the Adelie Penguin rookery on the north flank of Mt. Melbourne. He added that in earlier seasons he had noticed groups of a dozen or more Emperor Penguins in the vicinity of Marble Point in McMurdo Sound, which suggested that there might be other small Emperor Penguin rookeries along the Victoria Land coast. In the 1957-58 season he had noticed an Emperor chick, still partly in down, on an ice-floe in McMurdo Sound, and he did not see how it could have drifted there from Cape Crozier or Coulman Island.

In the narrative of the National Antarctic Expedition of 1901-4, Captain Scott and Dr. E. A. Wilson recorded that many thousands of Emperor Penguins were observed from a distance on sea-ice near the junction of King Edward VII Land and the Ross Ice Shelf. So it is likely that a large rookery exists in that area. Scott also noticed from the vicinity of Cape Jones, that there were many penguins on the ice near the north-west end of Coulman Island, but did not investigate the occurrence closely.

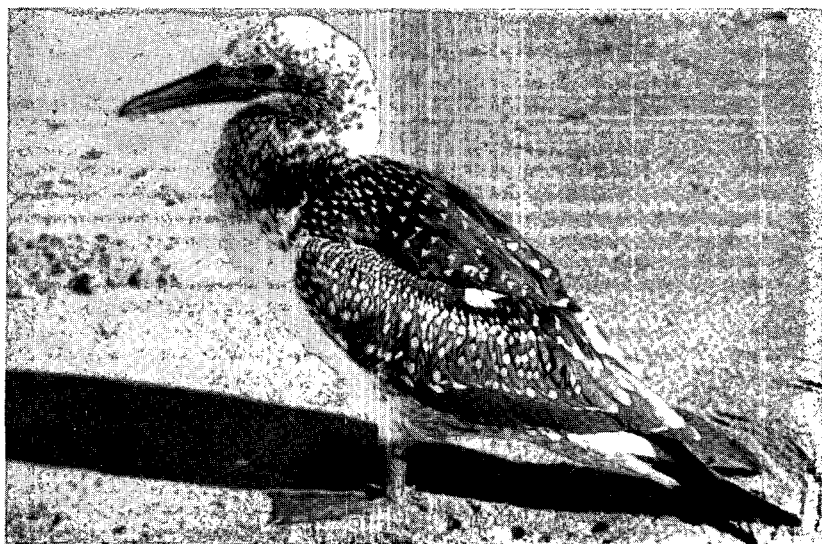
Flights from McMurdo Sound by photo-reconnaissance aircraft, at dates recommended by biologists, would be the most effective way of searching for new rookeries, and obtaining a record for census and other purposes of the known Emperor and Adelie Penguin rookeries in the Ross Sea. The aircraft could make one high-level sweep over each rookery to obtain general vertical aerial photographs, and another lower-level sweep to obtain vertical photographs for census purposes. The height of the lower sweep could be calculated in advance, as a function of the height of a penguin and the focal length of the camera lens, to ensure that individual penguins could be distinguished and counted.



NOTES ON THE BIRDS OF THE POOR KNIGHTS ISLANDS

By F. C. KINSKY and R. B. SIBSON

During the last decade much has been written about the birds of the outer islands of the Hauraki Gulf and reports on ornithological investigations on Little Barrier, Mokohinau and Hen and Chickens have appeared from time to time in *Notornis*. The Poor Knights, however, perhaps because of their general inaccessibility, have hardly been mentioned at all; and for many years the only authoritative account of the avifauna of this distinctive group has been a couple of papers (*Emu* 41. 56-58 and 45. 315-318) by Major G. A. Buddle, who camped on Aorangi in December, 1938 and November, 1940, and on Tawhiti-Rahi in January, 1943. We found these two papers an invaluable guide and they are likely to remain so for all future visitors to the Poor Knights who are interested in their natural history. In January, 1956,



XX **Top:** YOUNG GANNET ASHORE in January at Sandy Bay, Northland. This picture shows the plumage in which young Gannets leave the nest and set out on their journey across the Tasman Sea to Australian coastal waters.

[Photo by T. G. Ledgard

Bottom: VIEW FROM A HELICOPTER of the outermost arcs of Emperor Penguins at the rookery on Coulman Island, 6/12/'58.

[Photo by J. Premzic, U.S.N.