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NOTES ON SEA BIRDS BETWEEN NEW ZEALAND AND THE BOUNTY ISLANDS

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ABSTRACT

The distribution and abundance of the sea bird species seen during a cruise between New Zealand and the Bounty Islands in December 1970 are described. The field characters of White-capped Mollymawk and Salvin's Mollymawk are discussed. Cape Pigeons and Salvin's Mollymawks were very abundant around their breeding site on the Bounty Islands, but were scarce elsewhere. White-capped Mollymawks were numerous on the Pukaki Rise. White-chinned Petrels were common towards the southern end of the study area (lat. 50° S). The white feathering at the base of the mandible could not be seen in these birds in the field. The Subtropical Convergence, which occurred about lat. 44° S, was a definite southern boundary of the distribution of Buller's Shearwater and the Flesh-footed Shearwater.

INTRODUCTION

In December 1970 I was a guest on board the 3,210 ton research vessel *Kaiyo Maru* of the Japan Fishery Agency, Tokyo. The vessel left Wellington on 5 December 1970 and arrived at Lyttelton on 29 December 1970. Most of the cruise was spent in waters within the 500 m isobath on the Bounty Platform and the Pukaki Rise, with minor activities on the Chatham Rise and off Banks Peninsula (Fig. 1). I made sea bird observations on 16 out of the 23 full days at sea. The time spent watching sea birds varied from day to day, but was usually between one and two hours, the duration of individual watches ranging between 10 and 60 minutes. The sea surface temperature measured at the ship's cooling water intake was recorded with each sea bird watch. As a result of the ship's programme the data amount to clusters of observations on the Bounty Platform and the Pukaki Rise and scattered observations for other places.

The names used in this paper for the parts of the Mollymawk bill are taken from Serventy *et al.* (1972:61).

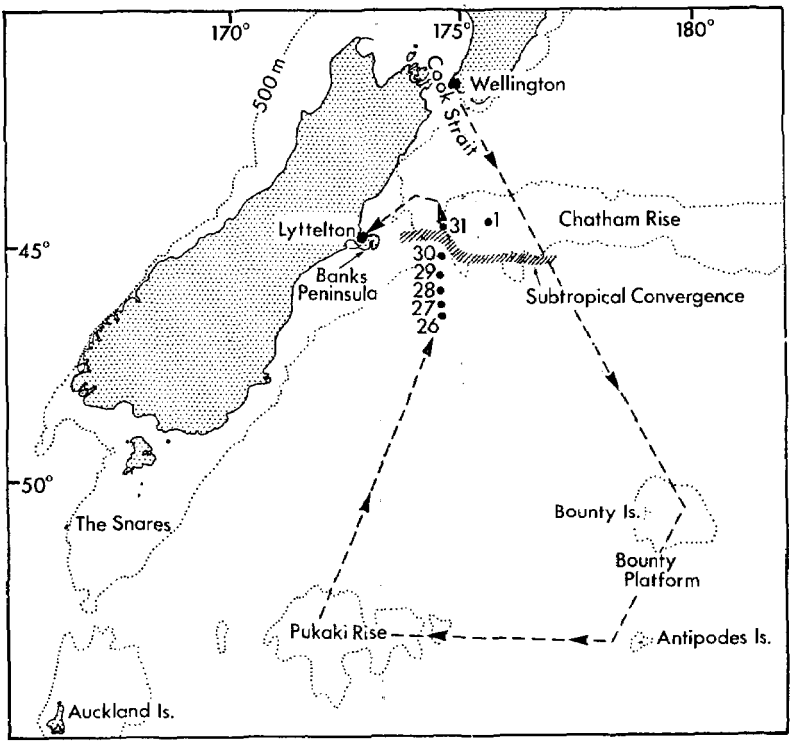

FIGURE 1 — The study area (after Lawrence 1967), with the Subtropical Convergence (after Nasu & Morita 1973), the generalised cruise track (broken lines), and some sea bird observation stations. The 500 m isobath is indicated by the dotted line.

OBSERVATIONS ON THE BOUNTY PLATFORM AND THE PUKAKI RISE

The species observed in these areas were given an index of abundance based on the order of magnitude of the numbers seen during a daily watch of about two hours:

Scarce — 1-10 birds.
Common — 10-100 birds.
Abundant — more than 100 birds.

In addition to unidentified prions and terns, 16 species were seen, of which 14 were Procellariidae (Table 1).

The great abundance of the Cape Pigeon on the Bounty Platform contrasted strongly with its scarcity elsewhere. The Bounty Islands are one of the breeding stations of this species, and the distribution

TABLE 1. Sea birds observed on the Bounty Platform (12-16 December 1970, sea surface temperature between 7.1 and 9.8 C) and the Pukaki Rise (18-25 December, sea surface temperature between 8.1 and 10.7 C).

Abundance indices : - not recorded; o scarce; x common; xx abundant

		Bounty Platform	Pukaki Rise
Royal Albatross	*Diomedea epomophora*	-	x
Wandering Albatross	*Diomedea exulans*	x	o
Black-browed Mollymawk	*Diomedea melanophris*	o	o
Grey-headed Mollymawk	*Diomedea chrysostoma*	-	o
White-capped Mollymawk	*Diomedea cauta cauta*	o	xx
Salvin's Mollymawk	*Diomedea cauta salvini*	xx	x
Light-mantled Sooty Albatross	*Phoebetria palpebrata*	o	o
Giant Petrel	*Macronectes giganteus*	o	-
Cape Pigeon	*Daption capensis*	xx	o
White-headed Petrel	*Pterodroma lessoni*	-	o
Mottled Petrel	*Pterodroma inexpectata*	-	x
White-chinned Petrel	*Procellaria aequinoctialis*	o	x
Sooty Shearwater	*Puffinus griseus*	x	o
Wilson's Storm Petrel	*Oceanites oceanicus*	x	o
Southern Skua	*Stercorarius skua lonnbergi*	o	o
Southern Black-backed Gull	*Larus dominicanus*	o	-
Prion	*Pachyptila* sp.	xx	-
Tern	*Sterna* sp.	o	-

of the birds indicated that in summer they concentrate near the breeding islands. This confirms observations by Ozawa *et al.* (1964) and explains the decrease of the numbers of this bird in the waters near New Zealand in spring (Vooren 1972).

Although several descriptions of the subspecies *cauta* and *salvini* of *Diomedea cauta* have been published (for instance Murphy 1930, 1936), identification of these birds at sea remains difficult, especially of the immature forms. A dark mandibular nail (unguis) has been stressed as the outstanding feature of both immature and mature Salvin's Mollymawks (J. A. Bartle pers. comm.) and can be easily seen in these birds once it is looked for (Figs 2a, b). However, the immatures of *Diomedea c. cauta* also show this feature (Simpson 1972, R. A. Falla pers. comm. 1973). It was absent in the breeding males and females of this subspecies collected during the 1972/73 Auckland Islands expedition (F. C. Kinsky unpublished data). Hence, the birds shown in Figs 3a and 4 are immatures and Fig. 3b a mature specimen of *Diomedea c. cauta.* In very young birds of this subspecies the head and neck down to shoulders and breast are an even light grey (Simpson 1972), and these parts become gradually lighter with age, so that the amount of grey on head and neck cannot be used to distinguish these juveniles from mature *Diomedea c. salvini.* But Simpson's description and photograph indicate that in the grey-headed young *Diomedea c. cauta* both the maxillary unguis and the mandibular unguis are very dark in colour, while in the adult *Diomedea c. salvini* the maxillary unguis is pale yellow (Fig. 2b).

If the two subspecies are seen together then the body size can be a guide in the identification, *Diomedea c. cauta* being noticeably larger. A comparison of Figs 2b and 3a suggests that this subspecies may also have a longer and heavier bill relative to the size of its head, but measurements on a few museum skins did not confirm this. The bill of *Diomedea c. cauta* did not appear to be deeper relative to its length compared with *Diomedea c. salvini*, and if the inter-orbital width is proportional to skull size, then the bill of the former subspecies is not longer relative to skull size (Table 2).

Falla (pers. comm. 1973) has also stated that *Diomedea c. cauta* has less dark colouring on the tip of the underwing than *Diomedea c. salvini*, and a comparison of Figs 2a and 4 confirms this. Examination of museum skins showed that this difference is due to the fact that the inner webs of the primaries are white in *Diomedea c. cauta* except for grey colouration at the very tip, while in *Diomedea c. salvini* they are entirely dark grey.

FIGURE 2a — Salvin's Mollymawk, *Diomedea cauta salvini*, mature plumage, Pukaki Rise, 22 December 1970.
Photo: A. Coakley

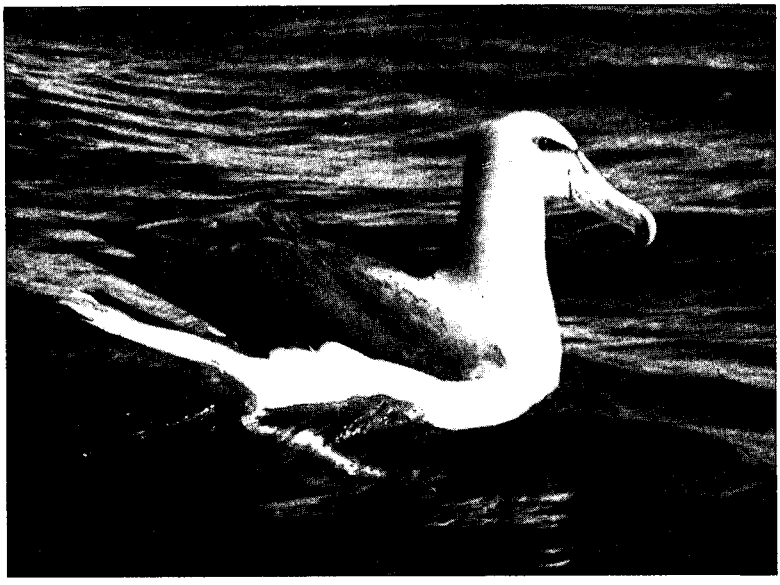

FIGURE 2b — Salvin's Mollymawk, *Diomedea cauta salvini*, mature plumage, off Gisborne, east coast of the North Island, May 1954.

Photo: M. K. McKenzie

TABLE 2. Some measurements on skins of *Diomedea cauta cauta* and *Diomedea cauta salvini*, present in the National Museum, Wellington. The specimen numbers are those under which the skins are listed in the catalogue of the museum. The interorbital width in the distance between the upper edges of the eye sockets, measured across the top of the head. 'Bill' measurements refer to the closed bill as a whole, with mandible and maxilla pressed together. Bill depth (tip) was measured just behind the maxillary unguis, and bill depth (base) just behind the nostrils. The 'middle' of the bill was located by eye, about half way between tip and base. All measurements are in mm.

	Diomedea cauta cauta						*Diomedea cauta salvini*					
	Female			Male			Female			Male		
Specimen No.	17388	17385	17283	17386	17282	17387	15522	1311	16415	13714	17384	16414
Interorbital width	50.8	64.7	63.0	62.0	68.0	64.5	53.6	52.3	52.7	61.8	63.2	57.0
Culmen length	123.3	130.0	127.3	133.8	136.7	135.0	121.7	128.2	121.4	125.8	132.1	132.8
Bill depth (tip)	29.5	28.9	27.9	32.5	29.9	30.8	29.4	27.0	28.4	29.5	29.6	29.3
Bill depth (middle)	30.9	31.9	31.5	33.8	34.5	33.0	30.4	28.3	30.1	31.4	32.3	31.2
Bill depth (base)	44.8	48.6	48.4	47.2	52.3	47.4	41.0	45.8	44.4	45.0	42.9	43.8
Bill width (middle)	16.4	18.4	19.1	19.6	18.8	18.4	16.0	14.0	17.0	16.0	18.0	18.5
Interorbital width/ culmen length	0.41	0.50	0.49	0.46	0.50	0.48	0.44	0.41	0.43	0.49	0.48	0.43
Bill depth (base)/ culmen length	0.36	0.37	0.38	0.35	0.38	0.35	0.34	0.36	0.37	0.36	0.32	0.33

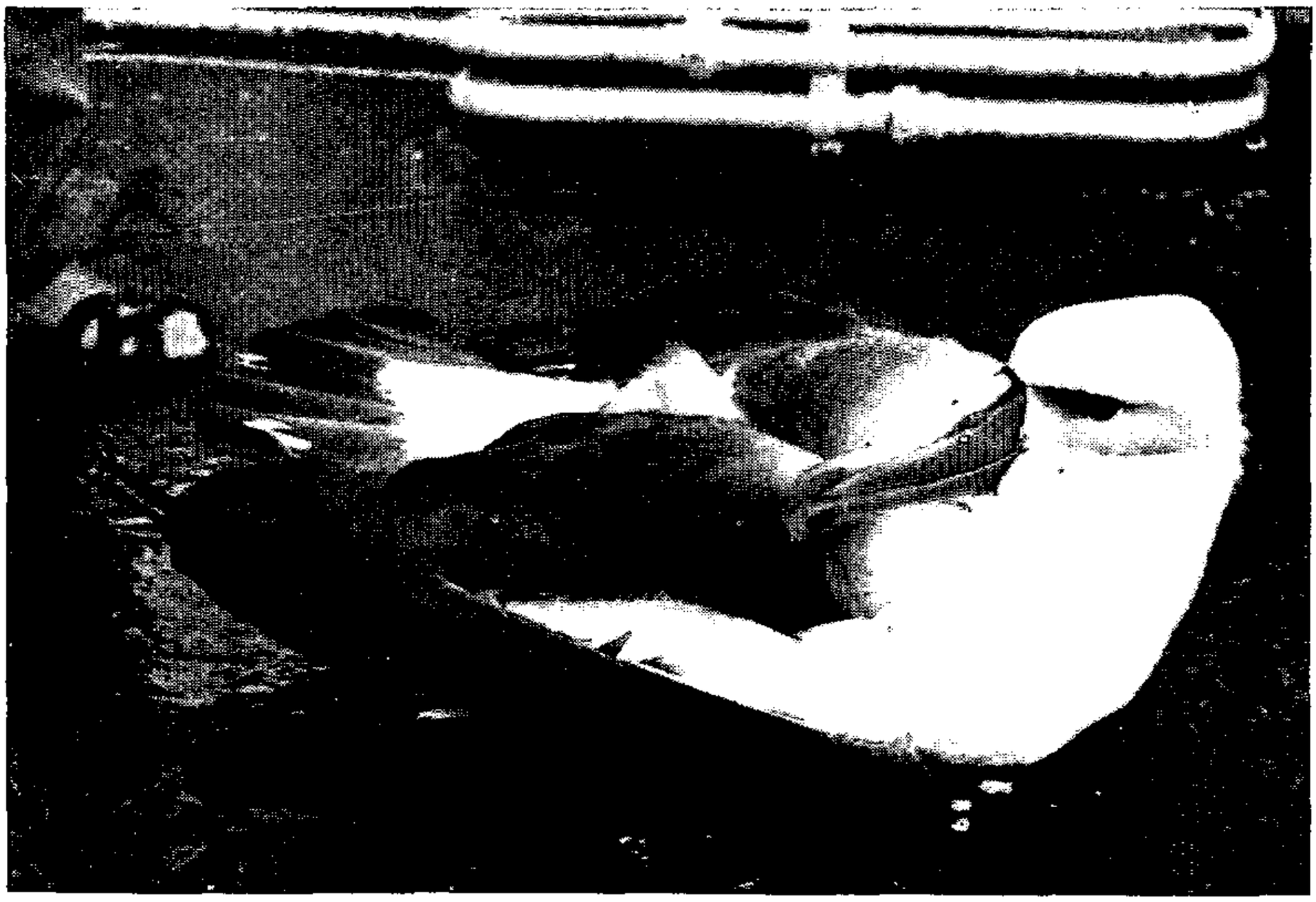

FIGURE 3a — White-capped Mollymawk, *Diomedea cauta cauta*, immature, off the west coast of the South Island, March/April 1973.
Photo: P. E. Roberts

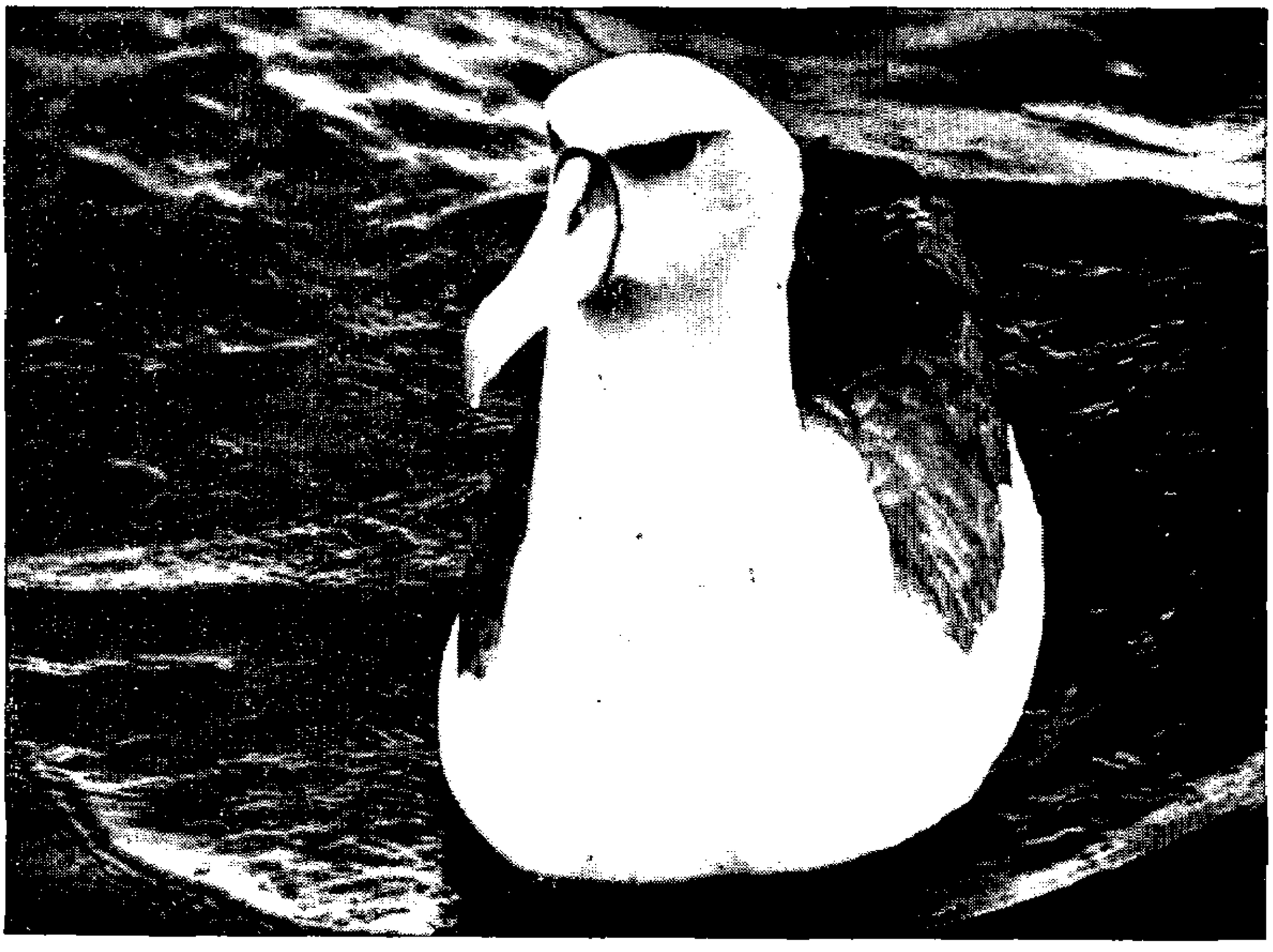

FIGURE 3b — White-capped Mollymawk, *Diomedea cauta cauta*, mature, off the west coast of the South Island, March/April 1973.
Photo: P. E. Roberts

The mollymawks seen around the Bounty Islands during the *Kaiyo Maru* cruise were mostly of the type shown in Fig. 2 and were identified as mature *Diomedea c. salvini.* These birds occurred there in immense numbers, and were obviously concentrating in the vicinity of their breeding site. Further westwards, on the Pukaki Rise, they were largely replaced by a mixture of mature and immature *Diomedea c. cauta.*

The White-chinned Petrel was, after *Diomedea c. cauta,* the commonest bird on the Pukaki Rise, although its abundance may have been over-estimated as a result of its tendency to follow the ship. White feathering on the chin, one of the key features of this species, was especially looked for, but was never seen in any of the birds. The distinguishing field characteristics were: overall dark colour, large size and heavy build, and heavy-yellowish or light-greenish horn-coloured bill. At a distance the species could at times

FIGURE 4 — White-capped Mollymawk, *Diomedea cauta cauta,* immature. Pukaki Rise, 22 December 1970.
Photo: A. Coakley

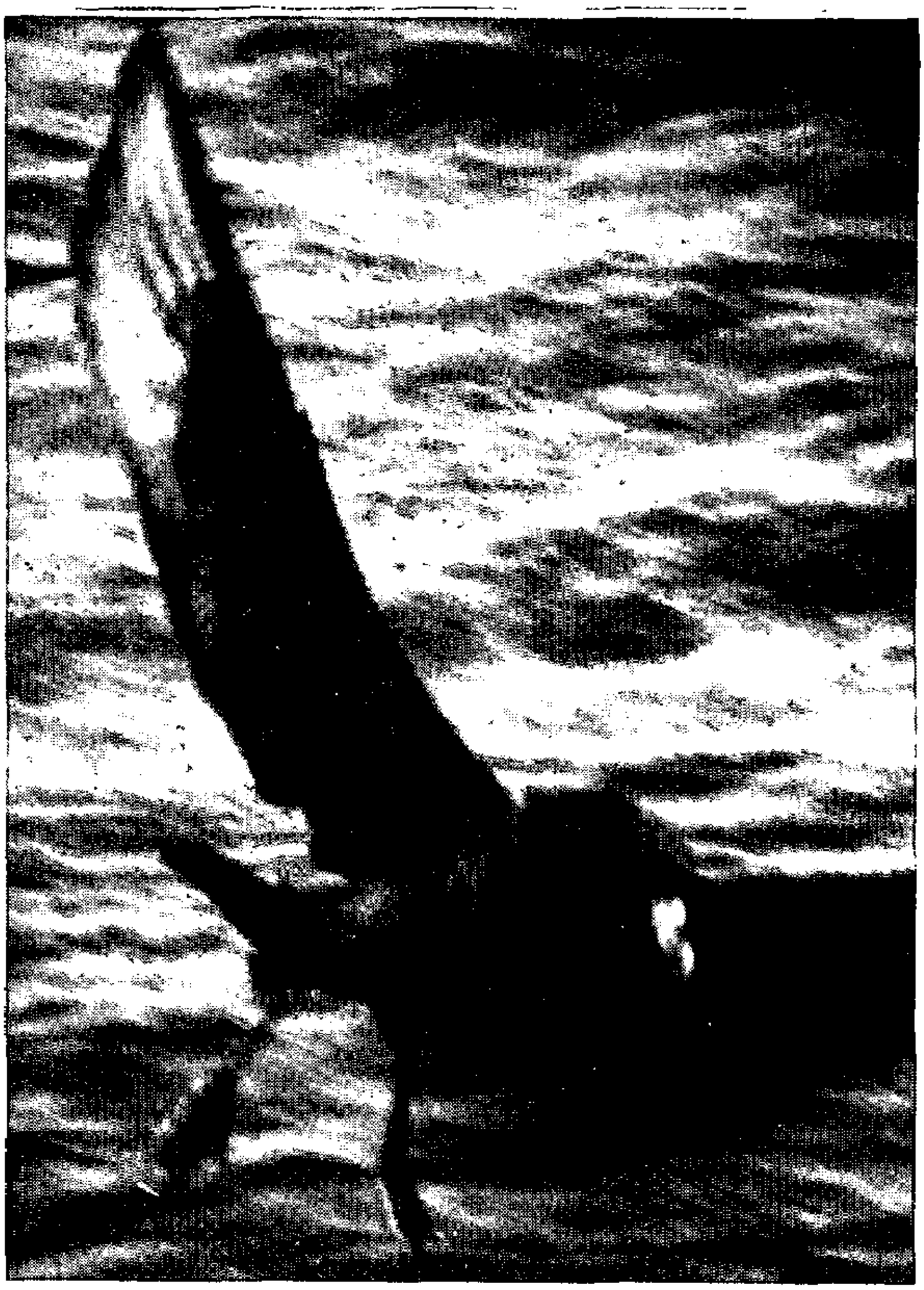

FIGURE 5 — White-chinned Petrel, *Procellaria aequinoctalis*. The under-surface of the primaries appears light on this photograph owing to reflected light, but it is in fact black. Pukaki Rise, 22 December 1970.

Photo: A. Coakley

be mistaken for the Giant Petrel. At close quarters the black markings on the bill (rims of nostrils, upper culminicorn, mandibular groove) and the black legs and feet could be seen (Fig. 5). The birds were also seen 100 km west of the Antipodes Islands and 100 km east of Banks Peninsula, so they occurred over a wide area, but especially near the southern edge of the cruising area (lat. 50° S) at surface temperatures between 8.1 and 10.7°C. This result is at variance with summer sea bird logs between New Zealand and the Ross Sea published by Dell (1960) and Darby (1970), who did not record the species at all or saw it only between Wellington and lat. 46° S, but Watson *et al.* (1971) list the species as common along ship's tracks between New Zealand and lat. 50° S.

BIRDS AROUND THE SUBTROPICAL CONVERGENCE

The Subtropical Convergence (abbreviated as STC) occurred to the east of Banks Peninsula (Fig. 1) and was crossed twice, once on the way south and once while returning to Lyttelton. The sea bird observation stations around the STC are shown in Fig. 1. The sea surface temperatures recorded at these setations illustrate the occurrence of the STC (Table 3). Buller's Shearwaters and Flesh-footed Shearwaters were the commonest birds at station 1. During the series of stations 26-31, Buller's Shearwaters suddenly became common at station 28 and were seen at all the following stations. Flesh-footed Shearwaters appeared at station 30 and were the commonest species there and at station 31. Dell (1960) and Darby (1970) did not mention the Flesh-footed Shearwater, but recorded Buller's Shearwater also only north of Banks Peninsula. In summer the STC apparently coincides with a distinct southern boundary of the distribution of Buller's Shearwater and Flesh-footed Shearwater. The White-chinned Petrel was uncommon as far north as the STC, but not entirely absent; two birds were seen at station 31.

Buller's Shearwater breeds in summer at the Poor Knights Islands, about 1,000 km north of the part of the STC visited by *Kaiyo Maru*. Manx Shearwaters, *Puffinus puffinus*, breeding at Skokholm in the British Isles are known to forage in the Bay of Biscay, 500 to 1,000 km away from their breeding grounds (Lockley 1969). Therefore, it is possible that Buller's Shearwaters seen at the STC are at the same time engaged in the breeding cycle at the Poor Knights Islands.

TABLE 3. Sea surface temperatures recorded at the cooling water intake of the research vessel *Kaiyo Maru* around the Subtropical Convergence (stations also shown in Fig. 1).

Station	Date	POSITION		Sea Surface Temperature (°C)
		Latitude (S)	Longitude (E)	
1	7/12/70	42° 23.4'	175°29.7'	15.6
26	27/12/70	44° 52.5'	174°30.0'	12.4
27	27/12/70	44° 43.0'	174°30.0'	13.4
28	27/12/70	44°30.0'	174°30.0'	13.6
29	27/12/70	44°20.0'	174°30.0'	14.8
30	27/12/70	44° 00.0'	174°30.0'	16.0
31	27/12/70	43° 33.0'	174°28.5'	17.0

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