OBSERVATIONS OF BIRDS AT SEA BETWEEN RÉUNION, KERGUELEN AND THE CROZET ISLANDS, JANUARY - MARCH 1982

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INTRODUCTION

During the austral summer 1982 I took part in a multidisciplinary expedition to the Crozet Islands (*Campagne Pluricro 1982*). Our voyage on board the M.S. *Marion Dufresne* (Fig. 1) started at Réunion on 29 January 1982, and we arrived at Possession Island, Crozet, on 3 February 1982. After one month's work on the islands, we departed on 3 March 1982 to Kerguelen and Réunion, where we arrived on 13 March 1982. During the sea voyages I made regular watches for seabirds at least twice a day, in the morning and in the afternoon (Voisin 1980a). The results are given in Table 1 (Réunion to Crozet), Table 2 (Crozet to Kerguelen) and Table 3 (Kerguelen to Réunion). These results are expressed as density indices which are the average number of birds seen in ten minute intervals. Of course, these indices are only distantly related to the true abundance of birds in the observed zone, amongst other reasons because of the very variable detection radius of the different species. But careful observation, and distance estimation by experienced seamen, showed that only the largest birds can be detected when more than one nautical mile away from the ship (even though, of course, many species can only be detected at a much shorter distance). So the influence of visibility is less important than one would imagine at first thought, provided it is over, say, one and a half or two miles. The quality of the light, i.e. sunshine with good contrasts or weak diffused light with weak contrasts under cloud is at least as important as visibility.

In Tables 1 - 3, species are listed in the order of sighting, in order to give a better impression of faunal assemblages. During all watches, the speed of the ship was between 12 and 15 knots, except on watch 18, when it was 10 knots. When not otherwise indicated, visibility was good or fairly good.

RESULTS AND DISCUSSION

The distribution of the birds encountered on these voyages is similar to that recorded by van Zinderen Bakker (1971) between Marion Island and Cape Town, Voisin (1980b) from Cape Town to Marion Island, the Crozets and back, Frost (1979) from Réunion to the Prince Edward, Crozet and Kerguelen Islands, Flora (1981) from South Africa to 65S, and Jouventin *et al.* (1982) between Réunion, the Crozets, Kerguelen and Amsterdam Islands. There was little variation, but a fairly clear-cut separation is visible between the rich, Subantarctic avifauna and the poor Subtropical one. The first Subantarctic species (Whitechinned Petrel *Procellaria aequinoctialis*, Softplumaged Petrel *Pterodroma*

TABLE 1

BIRDS SEEN AT SEA BETWEEN RÉUNION AND CROZET ISLANDS

	Watch number											
	1	2	3	4	5	6	7	8	9	10	11	12
Pterodroma baraui	4,3	0,08										
Bulweria fallax (?)		0,08										
Puffinus pacificus					0,25							
Procellaria aequinoctialis						0,42	0,25	1,00	7,40	3,60	14,10	40,0
Pterodroma mollis					a	-	0,08	0,50	0,35	0,54	2,49	0,17
Diomedea exulans						a	-	0,17	0,52	0,18	2,16	0,67
Diomedea chlororhynchos								0,58	0,35	0,36		
Fregetta tropica									0,26	-	1,62	0,33
Pachyptila spp.											e-+	e-+
Catharacta antarctica											0,86	-
Pelecanoides spp.											2,19	1,67
Garrodia nereis											0,10	-
Diomedea melanophrys											0,29	2,30
Pterodroma brevirostris											0,10	-
Phoebetria fusca											0,10	0,33
Macronectes halli											0,10	-
Pterodroma macroptera												0,17
Phoebetria palpebrata												0,50
Halobaena caerulea												0,17
Miscellaneous	-	-	-	-	M	-	Pn	Pt	-	Ml	H	H
All species together	4,3	0,17	0	0	0,33	0,42	0,33	2,3	9	4,72	23,3	46,4
Number of species	1	2	0	0	2	1	3	5	5	5	13	12

Watch details :

Watch no.	Date	Time (local)	Position	Sea temperature (°C)
1	29 Jan 82	18h05-18h50	Off W. coast of Réunion	28,0
2	30 Jan 82	08h20-10h20	24 26S, 54 44E	28 - 27
3	30 Jan 82	15h00-16h15	25 52S, 54 32E	26,8
4	31 Jan 82	07h45-09h00	28 53S, 54 05E	23,5

Watch no.	Date	Time (local)	Position	Sea temperature (°C)
5	31 Jan 82	14h30-16h30	30 12S, 53 50E	24,0
6 (1)	1 Feb 82	08h45-10h45	34 04S, 53 23E	20,0
7	1 Feb 82	14h45-16h45	36 04S, 53 13E	20,0
8	2 Feb 82	08h25-10h25	39 25S, 52 52E	18,0 - 16,7
9	2 Feb 82	14h15-16h10	40 25S, 52 48E	14,5 - 13,0
10	2 Feb 82	17h00-18h00	41 23S, 52 43E	13,0 - 14,5
11	3 Feb 82	08h25-10h40	44 44S, 52 03E	9,0 - 6,5
12	3 Feb 82	14h45-15h45	Off Possession Island	7,0

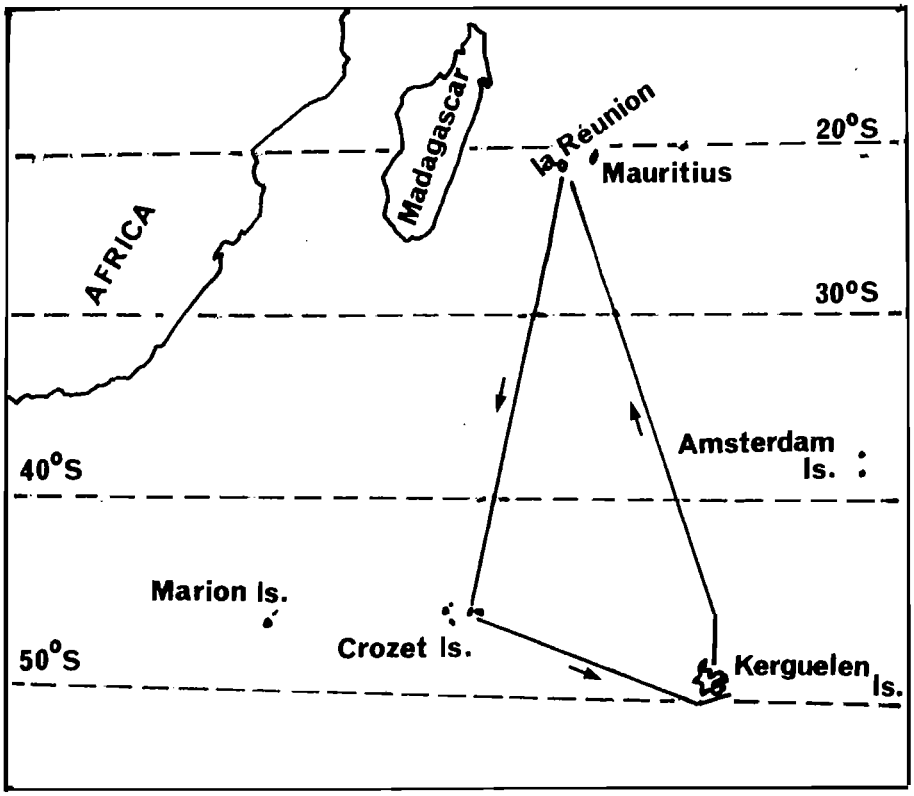

Figure 1

Cruise of the M.S. *Marion Dufresne* during *Campagne Pluricro 1982*, January - March 1982

TABLE 2

BIRDS SEEN AT SEA BETWEEN THE CROZET AND KERGUELEN ISLANDS

Date	3 Mar 82	4 Mar 82		5 Mar 82	
Time (local)	14h45 - 16h15	08h05 - 10h00	14h45 - 16h45	08h00 - 09h45	14h45 - 16h45
Position	46 41S, 52 51E	47 46S, 57 19E	48 13S, 59 07E	49 40S, 64 22E	49 50S, 66 39E
Sea temperature (°C)	7,8	9,5	9,0	6,8	6,5
Remarks	(3)	(2)	(2)	(1)	(1)
Watch no.	13	14	15	16	17
Procellaria aequinoctialis	6,83	0,78	1,04	7,10	10,26
Pachyptila spp.	23,25	0,52	0,52	3,50	2,78
Pterodroma mollis	3,33	0,26	0,52	0,21	0,17
Oceanites oceanicus	0,58	-	0,35	-	-
Diomedea chrysostoma	1,17	-	-	-	-
Phoebetria palpebrata	0,42	-	0,17	0,32	0,35
Diomedea melanophrys	0,67	-	-	-	0,17
Phoebetria fusca	1,08	-	-	-	-
Macronectes halli	1,00	-	-	-	0,09
Pelecanoides spp.	1,67	0,17	0,43	1,79	0,35
Fregetta tropica	0,42	0,10	0,35	-	0,09
Macronectes giganteus	0,08	-	-	-	-
Diomedea exulans	1,42	-	-	0,84	0,61
Daption capense	0,08	-	-	-	-
Pterodroma macroptera	0,50	-	-	0,12	-
Garrodia nereis	0,08	-	-	-	-
Pterodroma brevirostris	0,42	-	-	0,95	0,87
Eudyptes spp.	-	-	-	-	0,09
Aptenodytes patagonicus	-	-	-	-	0,43
Penguins ind.	0,50	-	0,26	0,63	-
Miscellaneous	-	-	HCO	F	PnH
All species together	21,40	1,30	3,17	12,10	13,92
Number of species	18	5	11	10	14

TABLE 3

BIRDS SEEN AT SEA BETWEEN KERGUELEN AND RÉUNION ISLANDS

	Watch number										
	18	19	20	21	22	23	24	25	26	27	28
Diomedea melanophrys	3,33	0,17									
Pachyptila spp.	++	0,83	0,17								
Procellaria aequinoctialis	21,50	7,50	2,00	4,10	1,16	4,25	12,92	2,29	0,58	a	a
Procellaria cinerea	0,33										
Pterodroma mollis	1,17	0,25	0,17	-	0,17	0,08					
Phoebetria palpebrata	0,83										
Macronectes halli	0,83										
Oceanites oceanicus	6,00										
Catharacta antarctica	0,33	0,08				-	-	-	-	0,09	
Pygoscelis papua	1,00										
Halobaena caerulea	0,17										
Diomedea exulans	0,17	1,25	0,35	0,19	-						
Eudyptes spp.	0,33	-	0,09			0,42	1,33	1,43			
Phalacrocorax atriceps	0,50										
Fregetta tropica		0,08									
Phoebetria fusca			0,09								
Diomedea chlororhynchos				0,29	0,33						
Macronectes giganteus					0,33						
Pterodroma macroptera						0,17					
Pterodroma baraui						0,17	0,83	-	0,08		
Puffinus carneipes								0,29	-	-	0,15
Miscellaneous		O	Pt			Pt				Pf	
All species together	36,10	9,40	2,78	4,57	2,17	5,16	15,08	4,00	0,67	0,29	0,15
Number of species	14	8	6	3	4	6	3	3	2		1

Watch details of Table 3 :

Watch no.		Time (local)	Position	Sea temperature (°C)
18	7 Mar 82	13h55-14h55	Passe de la Résolution, Kerguelen	7,0
19	8 Mar 82	08h00-10h00	46 20S, 70 19E	9,4
20	8 Mar 82	15h15-17h10	44 58S, 70 04E	10,9
21	9 Mar 82	08h15-09h10	41 51S, 67 40E	15,5 - 17,0
22	9 Mar 82	15h40-16h40	40 26S, 66 47E	19,0
23	10 Mar 82	08h00-10h00	36 26S, 64 09E	20,0 - 22,0
24	10 Mar 82	14h35-16h35	35 35S, 63 18E	21,0 - 22,5
25	10 Mar 82	17h55-18h30	32 21S, 62 55E	22,0
26	11 Mar 82	08h05-10h05	31 27S, 61 10E	23,0 - 24,0
27 (2)	11 Mar 82	14h00-16h00	30 25S, 60 56E	24,5
28	11 Mar 82	17h25-18h30	29 12S, 59 48E	25,0
29*	12 Mar 82	07h55-09h55	26 23S, 58 09E	25,0
30*	12 Mar 82	13h45-15h00	25 10S, 57 27E	26,8
31*	12 Mar 82	15h40-16h40	24 34S, 57 04E	27,0
32*	12 Mar 82	17h15-18h15	24 26S, 56 59E	27,0

*No birds recorded

FOOTNOTES TO TABLES 1 - 3

Remarks :

(1) The sea floor rises to a plateau at a depth of 150 - 250 m.

(2) Rainy weather with fog banks, visibility varying from average to bad.

(3) The watch began when the ship was just off the easternmost point of East Island, Crozets.

Density indices :

e too numerous to be counted, evenly distributed with a low density at the surface of the sea;

\+ the same as e, but at a high density;

++ the same as e and +, but at a high and irregular density;

a species not seen during the watch but present at least for a while behind the ship during the watch

Miscellaneous :

M unidentified penguin

Pn unidentified black shearwater

Pf unidentified gadfly petrel

Ml unidentified mollymawk

H unidentified stormpetrel(s)

C unidentified cormorant

F unidentified sooty albatross

O unidentified bird

mollis, Wandering Albatross *Diomedea exulans*) appeared just north of the Subtropical Convergence, or when the temperature of the sea begins to fall, but this Subantarctic avifauna only reaches its full development when the Convergence is entirely passed. On the return cruise, Wandering Albatrosses and Whitechinned Petrels followed the *Marion Dufresne* a long way north, and the latter was still noticed on watch 28, north of 29S (Table 3).

The Yellownosed Albatross *Diomedea chlororhynchos* was the only species encountered only on the convergence. However, this species of temperate waters does occur further south, notably near the Crozets (Derenne *et al.* 1980b) where it was found breeding in 1982. All the ones encountered on 9 March 1982 were flying straight across the ship's route coming from or heading in the direction of St Paul's and Amsterdam Islands, where this species breeds in large numbers.

The numbers of species seen per watch increased regularly from north to south, and was largest near the Subantarctic islands. On the contrary, the average numbers of birds of all species seen per 10 minute period evolved much more irregularly. It reached its maximum near the Crozet and Kerguelen Islands and on the Convergence (watch 9) and just north of it (watch 24). This distribution is evidently related to both the breeding cycle and feeding habits of the species. The rôle of the Subtropical Convergence will not be discussed further in this report. It is to be noted that a few species (Wandering Albatross, Softplumaged Petrel, Blackbellied Stormpetrel *Fregetta tropica*) did not reach their maximum density index near the islands, but at some distance from them.

Barau's Petrel *Pterodroma baraui* is not uncommon during its breeding season off the coasts of Réunion, the only place, with Rodrigues Island, where it is known to nest. Its distribution at sea is poorly known. My observations of watches 1 and 2 fall well within the range of those cited by Jouanin & Gill (1967), which were made between 54 30E and 55E, and from 20S to 24S, and even, but with somewhat uncertain determination, to 27S. But the observations of watches 23, 24 and 26 do extend this range by about 9° further south. Sinclair (1979) did not see this species during his voyage through the Mozambique Channel and the northern Indian Ocean. Harper & Kinsky (1978) do not list it in their fieldguide of Procellariiformes occurring south of the Tropic of Capricorn.

I was very puzzled when, on watch 2, I observed an all black gadfly petrel with a long tail, and did not think at the time of Jouanin's Petrel *Bulweria fallax*. But my colleague H. Weimerskirch (pers.comm.), who knows this species well, saw one at about the same latitude on 12 March 1982, at about 12h30, just after I had finished my watch, and told me that several other individuals of this species had been observed in Subtropical waters in March 1981, when the ship was going to the Crozets (Bartle, Stahl & Weimerskirch in prep.). This species does not seem to have been previously recorded south of the Tropic of Capricorn. However, my record must be considered a probability only.

Only a very few Blue Petrels *Halobaena caerulea* were seen, even

though this species breeds in good numbers on some of the Crozet Islands. It probably does not stay in coastal waters after leaving its nest, but heads at once for its pelagic quarters.

Divingpetrels *Pelecanoides* spp. were usually not determined to species. Sometimes, however, when viewing conditions were good and other birds not too numerous, this determination was done. The Common Divingpetrel *P. urinatrix* was positively identified on watches 13, 15 and 16, and the Georgian Divingpetrel *P. georgicus* on watches 13 and 16. The criterion which was used in order to discriminate between these two species was the colour of the underwing, which is pale in the Georgian Divingpetrel and greyish in the Common Divingpetrel (J.-C. Stahl, pers. comm.).

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