

The White Phase of the Giant Petrel in Australia

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So far as published records go, only two examples of the white phase of the Giant Petrel (*Macronectes giganteus*) have hitherto been collected in Australian waters—one at Broken Bay, New South Wales, in September, 1914, and now preserved at the American Museum of Natural History (Mathews Collection), and the other at Busselton in June, 1937 (Western Australian Museum Collection). There is, in addition, a recent sight observation from Bunbury during the winter of 1933 (Whitlock, *Emu*, vol. xxxiii, p. 320), the only one, apparently, other than Gould's mention of the white individual which followed his ship for three weeks on the run between the Cape of Good Hope and Hobart.

To those records I now have to add the taking of a third Australian specimen—at Cronulla beach, New South Wales, on August 7, 1942. I found the bird dead at the north end of Bate Bay, in a perfect state of preservation and evidently washed up during the preceding tide, as it was quite undamaged by crows, which soon make havoc of marine specimens stranded on this beach. Some grease marks on the wing-tips and tail suggested that the bird had been caught, probably by fishermen, and allowed to walk about on a boat's deck. Death was due to drowning. Its body condition was good and there was food in the stomach, including feathers and a large cephalopod beak, whilst some refuse indicated that the bird had been feeding very near to Sydney and had not had an 'assisted passage' thither.

Like most white-phase birds of this species which have been described, the specimen had several dark feathers scattered about among the plumage. The iris was grey; the feet, including webs and toes, grey with dark-brown flecks, the claws pale horn, lighter than the toes; the bill pale greenish-yellow. There was a slight pink suffusion on the lower mandible, which has been noted by various authors, and appears to be a post-mortem effect. It became much more pronounced as the specimen dried and it then gradually assumed a light brown-horn hue. The weight was 3,090 gm. (6 lb. 13 oz.); length, 890 mm.; expanse of wings, 2,035 mm. (6 ft. 8 in.); wing, 530 mm.; tail, 174 mm.; exposed culmen, 95 mm.; tarsus, 89 mm.; middle toe and claw, 138 mm.

The bird was an immature male with very small rudimentary gonads, and the very narrow width—8.7 mm.—of the fronto-lateral tract in the skull would confirm this as an age-distinguishing character, as first suggested by H. T. Condon (*Trans. Roy. Soc. Sth. Austr.*, vol. 63, 1939, p. 320).

RELATIVE ABUNDANCE OF THE WHITE PHASE

In my log of sea-bird observations since November, 1938, in south-eastern Australia, I have noted about 37 individuals of Giant Petrels. One of these refers to a possible white bird seen from the M.V. *Warreen* on October 10, 1939, in Franklin Sound, Flinders Island; it was a large wholly-white bird sitting in the water, a little too far away to be identified with certainty, but was considered at the time to be probably a Giant Petrel. On November 14, 1941, about 30 miles north of Eden, New South Wales, I saw an individual which was mottled with white about the head and neck. All the remaining birds seen were the uniformly dark-brown immatures which are the rule in southern Australian seas. In addition to these I have seen five beach-drifted birds at Cronulla, including the present white example, and have one recorded observation of a live bird from the shore. Out of this total of 43 birds two are white individuals, if one includes the doubtful one of 1939. That gives a percentage of 4.7 and would represent the absolute maximum for the white phase on my data. Probably it would be less, as it might be doubted whether the white bird found on August 7 would have come to my notice had it not been caught in the first place by others.

I am able to give some additional sight records of this phase in south-eastern Australia. My colleague, Mr. J. A. Tubb, whilst en route from Launceston to Melbourne on the *Taroona*, saw a white bird in company with two dark birds on September 29, 1941, about an hour's steam off Port Phillip Heads. He also informs me that Mr. Joe Burgess, of King Island, captured a white example between King Island and the Three Hummock Island, Bass Strait, in July, 1941. The bird escaped before it could be shown to Mr. Tubb. This bird also was reported to have had black flecks in the plumage. Between April, 1939, and the end of July, 1942, Mr. Tubb has logged 20 Giant Petrels, of which one was white, that is 5% white birds. Further quantitative data of this kind from our waters are very desirable.

The progressive increase in relative abundance of the white phase in southern regions was clearly shown by Dr. E. A. Wilson during the Discovery Expedition of 1901-04. His records were as follows:

Between lat. 33° S and lat. 66° 7' S—

<i>Dark Birds</i>	<i>Intermediate</i>	<i>White</i>
At least 500	4	1 (about 0.2%)

Between lat. 66° 7' S and lat. 78° S—

<i>Dark Birds</i>	<i>Intermediate</i>	<i>White</i>
About 60	14	18 (about 18%)

The situation in the breeding colonies is not yet fully established, as the ratio of white to dark birds is not known for some of them. From the Atlantic area we have the following information: Falkland Is., lat. 51°, 2% (A. G. Bennett); South Georgia, lat. 54°, 2% (Sir Hubert Wilkins); South Orkney Is., lat. 63°, 10% (R. A. B. Ardley); and South Shetland Is., lat. 65°, 5 to 12½% (Bennett). In the Indo-Pacific sectors there are the following records: Chatham Is., lat. 44°, none reported so far (C. A. Fleming); Crozets, lat. 46°, and Kerguelen Is., lat. 49°, Stewart Is., lat. 47°, Auckland Is., lat. 51°, none reported (R. A. Falla); and Campbell Is., lat. 52°, none reported (Falla, *in litt.*); Macquarie Is., lat. 54°, 10% (Falla). Recorded breeding localities for which counts are not yet available include Antarctica (Coats Land, Kaiser Wilhelm II Land and Cape Adare), Gough Is., Prince Edward Is., Marion Is., and Heard Is.

It is clear that a cline exists in the proportion of white to dark birds, the gradient increasing with the latitude, and that applies both to the breeding groups and the ocean wanderers. Certainly no breeding colony so far examined has shown so high a percentage of white birds as has been reported at sea by observers, in particular Dr. Wilson, which led Dr. R. C. Murphy to argue that the distribution of white Giant Petrels illustrated the principle "of selection of a particular environment by a particular type of organism" (*Oceanic Birds of South America*, 1936, vol. I, p. 588), an explanation to which it is difficult to give credence. Rather some selective agency seems to be operating in favour of white birds in the far south as compared with the temperate regions, though no one would admit, of course, that a simple explanation like protective coloration would suffice for this particular species. Possibly a physiological basis is involved in the selective mechanism. At any rate this is far from being the only instance where the relation between character and environmental gradients cannot yet be satisfactorily accounted for.

Lieutenant R. A. B. Ardley (*Discovery Reports*, vol. XII, 1936, p. 359) discusses a very interesting position in the South Orkney Islands. He was there in 1933 and found a ratio of 10% of white birds in the breeding colonies, whereas 30 years previously the observers of the *Scotia* Expedition recorded only an average of 2% of white birds, suggesting that there may be a replacement going on of one phase by another.

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