

Giant-petrels in the South Atlantic: new data from Gough Island

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The Northern (Macronectes halli) and Southern (M. giganteus) Giant-petrels nest at islands between the Subtropical Convergence and the Antarctic continent, their breeding ranges overlapping at some islands near the Antarctic Convergence. Differences between the species include date of onset of laying, type of nest-site, and coloration of plumage and bill-tip. A review of the literature suggested that populations nesting at islands in the South Atlantic Ocean north of the Antarctic Convergence do not conform to either species. New observations from Gough Island in October and November 1973 support this suggestion and confirm that in some respects these birds combine the characteristics of both species. However, we need more information about the population of Giant-petrels at Gough Island and those at the other breeding stations in this region (Falkland Islands and Staten Island) before their taxonomic status can be assessed.

Die Noordelike (Macronectes halli) en die Suidelike (M. giganteus) Nellie broei op eilande tussen die Subtropiese Sameeloop en die Antarktiese Vasteland. Hul broeigebiede oorvleuel op sommige eilande naby die Antarktiese Sameeloop. Die spesies verskil onder meer aangaande die datum waarop hulle begin lê, die tipe plek waar hulle nes maak, en die kleur van die veredrag en die snawelpunt. Volgens 'n literatuuroorsig stem die bevolkings wat op eilande in die Suid-Atlantiese Oseaan noord van die Antarktiese Sameeloop broei, skynbaar nie ooreen met een van die twee spesies nie. Nuwe waarnemings by Gough-eiland in Oktober en November 1973 staaf hierdie vermoede en bevestig dat hierdie voëls in sommige opsigte die eienskappe van beide spesies verenig. Veel meer inligting oor die Nelliebevolking op Gough-eiland en dié op ander broeiplekke in hierdie gebied (Falkland-eilande en Staten-eiland) is egter nodig voordat hul taksonomiese stand beoordeel kan word.

Introduction

The genus *Macronectes* was shown by Bourne & Warham (1966) to comprise two sibling species, a polymorphic southern form, *M. giganteus* (Gmelin), and a monomorphic northern form, *M. halli* Mathews. Their breeding ranges lie south and north, respectively, of the Antarctic Convergence, overlapping at some islands near the Convergence. This revision has been substantiated by studies in the zone of sympatry: at Macquarie Island (Carrick & Ingham, 1970), the Crozet Islands (Voison, 1968, 1976; Despin *et al.*, 1972) and South Georgia (Conroy, unpublished). Johnstone (1974) summarised field characters for distinguishing these species, based on observations at Macquarie Island, the Australian Antarctic Territory, and at sea in the south-eastern Indian Ocean (Table 1). At fledging, the plumages of *M. halli* and dark-phased *M. giganteus* are indistinguishable. With increasing age both species become paler with very pale, sometimes white, feathering on the

head and neck. This becomes much more extensive in *M. giganteus* of breeding age than in *M. halli*, spreading over the entire head and neck and to the anterior edges of the wings (Johnstone, 1971; Conroy *et al.*, 1975).

Adult *M. giganteus* occur at sea mostly south of the Antarctic Convergence and adult *M. halli* mostly north of it, especially in summer (Johnstone, 1974); but fledglings of both species disperse northwards, visiting coastal waters of southern continents, particularly in winter. They begin to visit the breeding islands in their third year, and start breeding at five or six years of age (Conroy, 1972).

At all but one station well north of the Antarctic Convergence, Giant-petrels are early breeders (eggs laid by early to mid-September) and these have been designated *M. halli* (Bourne & Warham, 1966). The exception is the Falkland Islands. Also, reports of laying dates at Gough Island are conflicting. Special attention therefore attaches to these two populations in the South Atlantic Ocean (Fig. 1).

Falkland Islands

Bourne & Warham (1966) concluded that Giant-petrels breeding at the Falkland Islands were intermediate in appearance between *M. giganteus* and *M. halli*. In breeding behaviour they resembled *M. giganteus*, because the first eggs were laid in October and nesting was colonial in exposed places. For example, R. H. Beck's photograph (in Murphy, 1936, Plate 37) of a colony at Sea Lion Island, taken in December, shows pale-headed birds on eggs. Although white-phased birds have been seen on the islands and in adjacent waters, reports of such birds breeding there have not been substantiated (I. J. Strange, pers. comm.); only dark-phased birds are known to breed. Strange's colour photographs of breeding birds show them to have green unguis, indistinguishable from those of *M. giganteus*. One of us (J.W.H.C.) observed Giant-petrels in Port Stanley Harbour and adjacent waters during November 1972 and April 1973. Of 250 to 300 birds, none had the pinkish unguis characteristic of *M. halli* and those seen clearly, including those that gathered beside the ship at anchor, had green unguis. However, their plumage was mostly much darker than that of *M. giganteus* at the South Orkney Islands and, unlike *M. giganteus*, they followed the ship at sea and attended it at anchor.

Gough Island

Although Giant-petrels once bred on Tristan da Cunha (Moseley, 1879) they have not done so since about 1870 (Hagen, 1952). The only place in the central South Atlantic Ocean where they still breed is Gough Island. Swales (1965) reported newly hatched chicks there in early December, which, with an incubation period of 60 days (Conroy, 1972),

Table 1
Characteristics that distinguish *Macronectes giganteus* and *M. halli* (summarised from Johnstone, 1974)

Character	<i>M. giganteus</i>	<i>M. halli</i>
Plumage phases	Dark and white* colour phases	Dark phase only
Plumage of chick†	—	Darker on upper surface than dark-phased <i>M. giganteus</i>
Colour of end-plate	Pale green; little contrast with rest of bill in monochrome photos	Pinkish or brownish, often with dark grey or black marks. Contrast with rest of bill
Onset of breeding	Late September to mid-October	First half of August to early September
Nest site	Usually exposed	Usually sheltered
Nesting dispersion	Mostly colonial	More often solitary
Reaction to ships	Uncommon at ships	Follows ships at sea, attends ships at rest
Pelagic distribution of adults	Mostly south of Antarctic Convergence	Mostly north of Antarctic Convergence

*White phase occurs in frequencies between 0 and 15% in breeding populations (Shaughnessy, 1971)

†Details given by Voisin (1968)

suggested a late laying date in early October. However, according to Swales' unpublished account of the rediscovery of breeding Giant-petrels at Gough Island, the chicks were found in early November, indicating laying in early September (confirmed by M. K. Swales, pers. comm.). This agrees with Verrill's (1895) record for the first egg in 1888, on 11 September. Swales (1965) recorded four nests, and that 'there may have been as many as 60' (p. 36), all hidden among ferns. No white-phased birds were found. These observations indicate that the species breeding on Gough Island was *M. halli*. However, recent observations there cast doubt on this conclusion.

New observations from Gough Island

P.D.S. visited Gough Island from 13 October to 11 November 1973. The valleys north-west of Green Hill above the cliff opposite Saddle Island were searched on 2 November for the nesting area reported by Swales (1965). No nests were found, but several Giant-petrels flew past, some as close as

20 m. They had uniform dark plumage and a pale, horn-coloured bill with an inconspicuously marked tip. Since the search party must have been within 0.5 km of the nesting locality reported by Swales, it is possible that these birds were associated with those nests. No Giant-petrels were seen on other journeys on the island between the meteorological station ('Gough House') in Transvaal Bay and South Peak, Edinburgh Peak, Snug Harbour and Luff Point (Fig. 2).

A nest containing a young chick guarded by an adult male was found on 8 November on Long Beach, Hawkins Bay, about 0.5 km north-west of Wild Glen. It was 20 m from the shore at the base of a 2-m high tussock of *Spartina arundinacea*. P.D.S. recorded the adult's bill as horn-coloured with a greenish tip and the iris pale grey with some dark marks. Colour photographs show a plumage similar to the palest *M. halli* noted by G.W.J. at Macquarie Island, and paler than the darkest *M. giganteus* breeding there. Both adult and chick were collected. They were examined by G.W.J. at the National Museum of Victoria, Australia. The

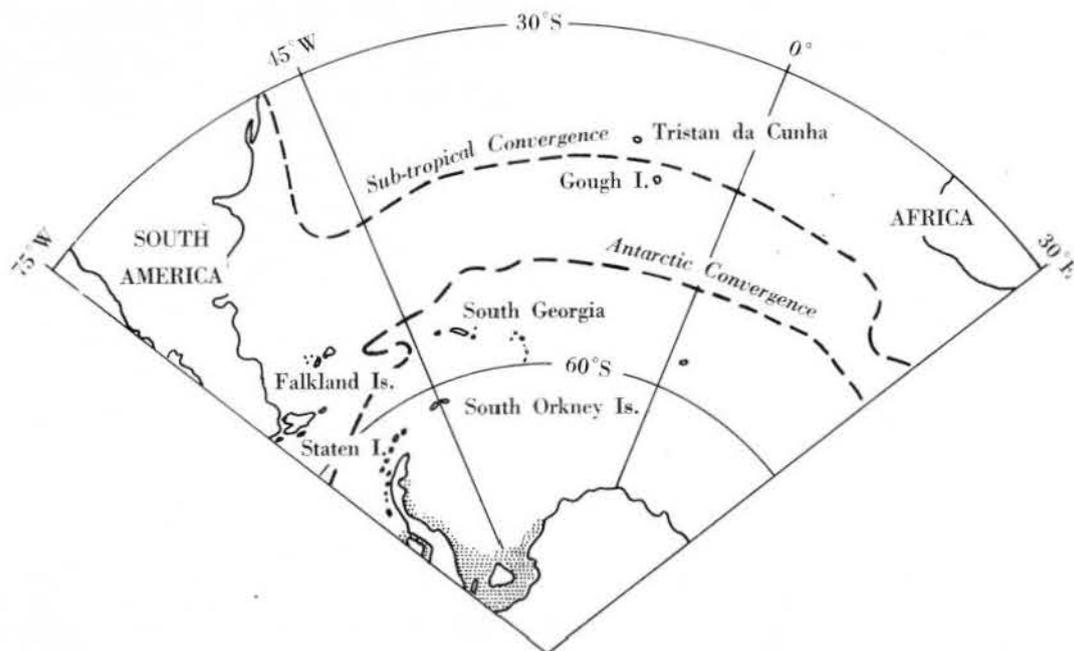


Fig. 1. Map of the South Atlantic Ocean.

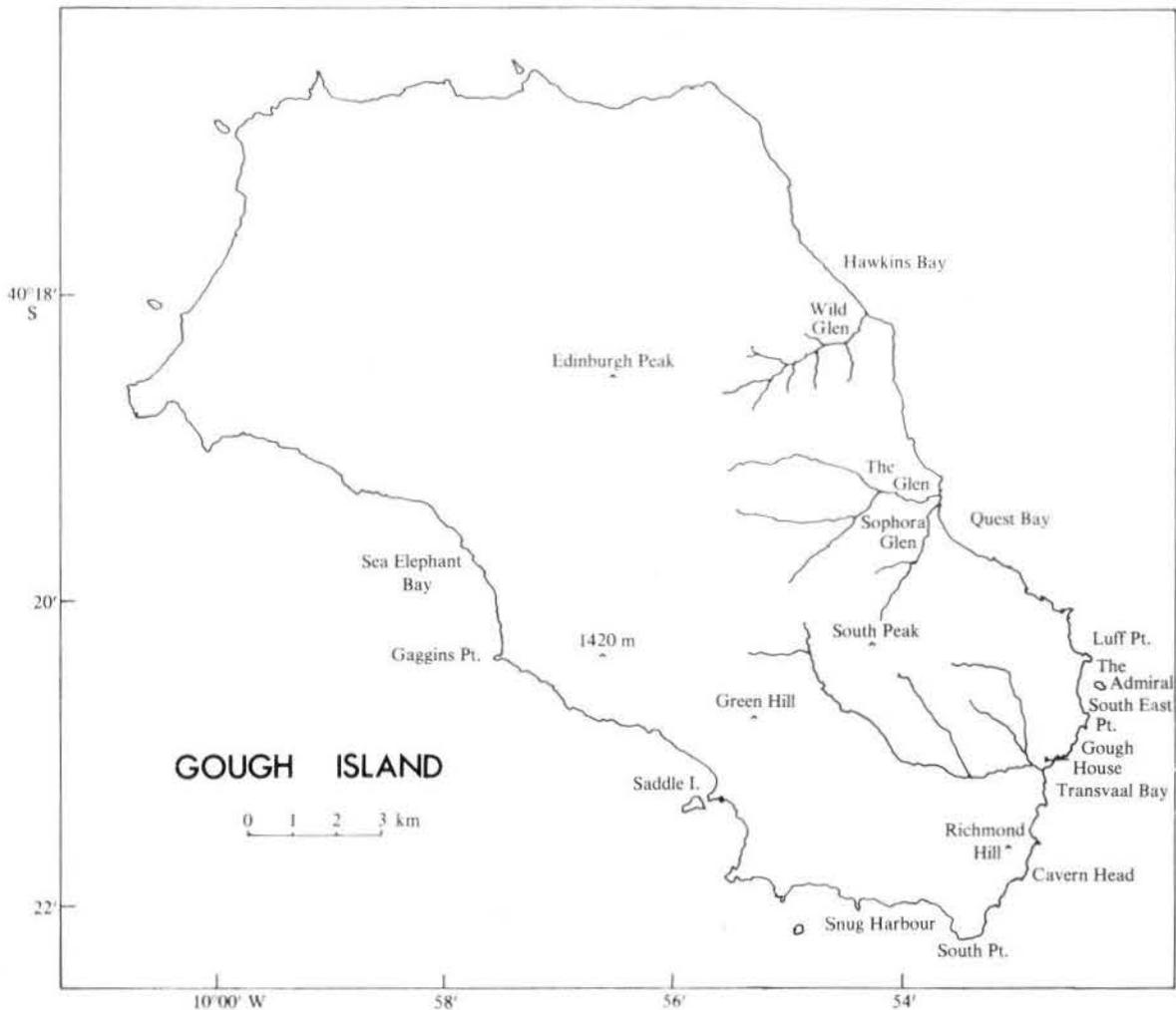


Fig. 2. Map of Gough Island showing locations referred to in the text.

adult had neck, cheeks and forehead creamy white rather than the pure white characteristic of some adult *M. giganteus*, and its crown, neck and leading edge of the wings were mottled dark grey on creamy white. Most of the body plumage was fairly fresh with only a few brown feathers; there was no wing or tail moult and primaries and rectrices were old with abraded tips. The chick had dorsum darker than venter, but there was no clear delineation between the darker dorsal down and the paler areas as is characteristic of *M. halli*. Overall its down was darker than that of a typical *M. giganteus*. Its bill was 47,6 mm long, which, by comparison with G.W.J.'s unpublished data for chicks at Macquarie Island, indicates an age of 12 to 15 days. The chick was collected on 8 November, suggesting a laying date in the last week of August.

Ten Giant-petrels were seen feeding on the carcass of an elephant seal pup on Long Beach on 8 November. They had dark plumage with mottled grey foreheads and greenish unguis; unfortunately the colour of their unguis cannot be discerned in photographs taken at the time. Another 50 dark Giant-petrels were resting 50 m off-shore in Hawkins Bay at the time.

Up to 50 Giant-petrels attended the *RSA* while it was at anchor off the west and east coasts of Gough Island. Other Giant-petrels attended crayfishing boats in the area. About 5% of these birds had a white head and breast; the remainder had very dark plumage. The pale individuals were always among those closest to the ship and one, a female, was collected in Sea Elephant Bay on 14 October. Colour photographs show a greenish bill-tip and very pale plumage,

resembling the palest of dark-phased *M. giganteus*. Its iris was very pale grey with dark flecks. This bird was later examined at the National Museum of Victoria. None of its plumage was pure white, but it was an extremely pale bird: underparts from throat to tail were pale pearly-grey, becoming darker (smoke-grey) in the ventral region; cheeks were a little greyer than the throat, head, neck and leading edge of wings with additional grey mottling; back and tail were darker with some old brown feathers. On each wing the outermost primary was starting to grow in, having just broken the sheath. The second primary was not quite fully grown and the other primaries were all new. The tail moult had evidently recently been completed, with all rectrices in a fresh condition.

No birds were seen with the pinkish unguis of *M. halli*, and no white-phased Giant-petrels were seen at Gough Island.

Discussion

The Giant-petrel collected on the ship differs markedly in plumage coloration and stage of moult from the adult collected from the nest. Breeding *M. giganteus* defer wing moult until late in the season (Conroy, 1972), and *M. halli* do the same (G.W.J., unpublished). Since the adult collected in Sea Elephant Bay had virtually completed its primary and tail moults and represented one of only 5 per cent of the birds attending the ship, it must be questioned whether it belonged to the local breeding population. It may have been *M. giganteus*, but if so its plumage indicates it to have been an old bird and mid-October seems very late for it to have been in such relatively northern waters. Further, *M. giganteus* does not normally attend ships,

The bird taken at the nest, and most of the other Giant-petrels seen at or near Gough Island, resembled those recorded breeding on the Falkland Islands, having darker plumage than most *M. giganteus* of breeding age, and, like *M. giganteus*, green unguis. Unlike *M. giganteus*, Giant-petrels at both places attended ships at anchor and followed them at sea. However, their breeding biology differs: at Gough Island they lay in late August to mid-September in sheltered, widely dispersed sites (like *M. halli*), but on the Falkland Islands they lay later (October) and, at least on Sea Lion Island, in exposed colonies (like *M. giganteus*). Thus Giant-petrels at both Gough Island and the Falkland Islands combine characteristics of the two species.

Although Gough Island and the Falkland Islands are nearly 4 000 km and more than 11 degrees of latitude apart, they are in the same faunal zone of the South Atlantic between the Antarctic and Subtropical Convergences and both support apparently aberrant forms of Giant-petrels. Differences in breeding biology between the two populations may be responses to the different climates and habitats of the two locations; similar differences occur, for example, between populations of *M. giganteus* at Subantarctic islands and the Antarctic Continent. Other studies have emphasized the role of the Antarctic Convergence in marking a boundary between avifaunal regions (Fleming, 1941, 1942; Murphy, 1960, 1964; Szijj, 1967; Watson *et al.*, 1971) and as an isolating factor between the two recognised species of Giant-petrels (Bourne & Warham, 1966; Johnstone, 1974).

The only other place in this South Atlantic faunal zone where Giant-petrels breed is Staten Island (Isla de los Estados), about 450 km south-west of the Falkland Islands (Crow, 1975), but no information about their appearance or breeding biology is available. The type specimen of *M. giganteus* was collected at sea near Staten Island in mid-summer during Cook's second voyage (1771-75) (Conroy, 1972), but could as well have been a bird that had travelled far from its place of origin as a member of a local breeding population.

It has been established beyond doubt that at islands of sympatry, *M. halli* and *M. giganteus* are genetically isolated sibling species. It is possible that in this South Atlantic region either the original stock did not evolve into two separate forms or that, separation having taken place, the isolating mechanism has since broken down and hybridization has occurred. With our present meagre knowledge, the correct taxonomy of the Giant-petrels breeding at Gough, Falkland and Staten Islands must await further research, and they are best referred to as *Macronectes* sp.

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