

The Nesting Habitat of the Royal Albatross on Campbell Island

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The southern royal albatross (*Diomedea epomophora epomophora* Lesson) has two habitats in which it spends its entire life: the southern seas and Campbell Island. During its first 8 or 9 years of life, and during the every other year when it does not breed, and when it is not on the nest incubating or tending the young, the albatross is gliding over the South Pacific in search of food, or resting at sea.

Every other year the albatrosses come ashore to breed on the rain- and windswept ridges of Campbell Island. Many birds are exacting in their requirements for their nesting habitat, the actual nest site, nest material, display ground, loafing spots and various other needs, and so too, do the albatrosses have their not many but specific requirements.

CAMPBELL ISLAND

Aside from a few pairs of the southern royal albatross nesting on Enderby Island in the Auckland group, Campbell Island is the only known nesting ground in the world for this, the largest of all sea birds.

Campbell Island is situated in latitude 52° 30' S., approximately 450 miles south of Dunedin. It covers an area of 42 square miles and measures about 10 by 10 miles. The half-a-mile wide Perseverance Harbour, running in an east-west direction for 6 miles, cuts the island across the middle. The island is an old volcanic cone with many ridges and spurs, the highest peak is Mt. Honey (1,867 ft.). The lower parts are covered in dense *Dracophyllum* scrub which at an altitude of about 400 ft. gives way to tussock. Introduced sheep have modified the tussock vegetation, the main effect being exclusion of various very palatable flowering plants, such as species of *Pleurophyllum*, and the extension of *Chrysobactron rossii*. This change in the tussock formation has not been to the benefit of the nesting albatrosses. The climate is rigorous with continuous high winds, a low temperature,

very high air humidity, constant drizzling rain although the total annual rainfall is not high (57 in.), very frequent fog, mist and low cloud on the ridges, and few hours of sunshine. The soil is a black peat, well capable of absorbing the abundant moisture.

I had the pleasure of visiting Campbell Island as a liaison officer for the Department of Internal Affairs with the "Campbell Island Scientific Expedition" from Denver Museum of Natural History, Colorado, U.S.A. We stayed on the island from 7 January till 19 February, 1958. Aside from my other duties I was able to study the distribution, numbers and habitat of the royal albatross in its ancient breeding ground.

REQUIREMENTS OF THE COLONY

Some of the major requirements of the albatrosses for their nesting habitat, as conditions affect the whole population, will be discussed first.

Sufficient food of the right kind is an indispensable item in most land birds' requirements of their nesting territory, but a far-ranging sea bird like the royal albatross has the boundless southern ocean as its feeding trough. Non-nesting birds are found in New Zealand waters, and across the South Pacific too and including both eastern and western coasts of South America. In this vast expanse of water they obtain their food in the form of squids and various species of fish, including *Notothenia* spp. It is not known how far away from the island nesting albatrosses move when they are temporarily relieved by their mate in incubation and chick-guarding duties; but as the non-incubating birds may be away from the nest for one or even two weeks at a time, it is conceivable that they fly many hundred miles in their search for food. The apparent low number of suitable fish and squid for food in the sea surrounding the island is, therefore, of no importance.

One essential requirement for this big, heavy bird is an almost permanent strong wind, enabling it to land and take off on the ridges near the nesting ground. The weight of royal albatrosses varies according to sex, time of fasting on nest, and probably age and time of year. Ten adult albatrosses I weighed ranged from 14½ to 21 lbs., the males being the heavier. Young albatrosses on the nest grow very fat and may increase to as much as 32½ lbs. (Sorensen, 1950). The wing-span of the royal albatross is 10–11 ft. Its wing beat is very slow, and it is more of a glider than a flier. On the only calm day we experienced on Campbell Island, the albatrosses were incapable of taking off and landing. On such a day the upper ridges present an unusual sight with all albatrosses "grounded" although birds were seen gliding in the air above the ridges and out to sea. On the very rare calm days the albatrosses are incapable of getting enough updrift while running to get airborne, but may succeed by running down a slope, launching themselves over a vertical bluff, as observed by Sorensen. Even on windy days they could easily be caught (for banding) when we approached them from the windward side: they would run and skelter through the tussock away from the wind, wings lifted in an attempt to take off; when cornered they would face the wind and maybe give it a last try or just stand and accept the inevitable.

With its many ridges and spurs Campbell Island is eminently suited for nesting royal albatrosses as the ridge tops with the strong winds and up-winds constantly blowing make ideal starting points where the albatrosses can get into the air, and land. The island is commonly known for being very windy; on no less than 71 days in the average year are winds with gale force blowing, and gales may occur on any day of the year. Only 1 per cent. of the days of the year are calm, i.e. with a wind velocity of below 4 m.p.h. The mean wind velocity for the year is 30.9 m.p.h. Gale forces as high as 60 m.p.h. as an average for a 24-hour period have been recorded. The predominant winds are westerly and north-westerly. When gales are blowing, the albatrosses are able to take off by jumping into the air with unfolded wings as I observed on several occasions. The usual way of take-off is for the albatross to run into the wind on the upper flat part of a ridge, with outstretched beating wings; the up-winds then lift the bird off, and when air-borne it swings into the wind, fully utilizing the combined effect of the wind and its own weight and forward speed.

The colony of these large birds, which are so defenceless on the ground, is in need of full protection from man and predator alike. Albatrosses on Campbell Island, in its virgin state, had only one potential enemy, the southern skua, but it is doubtful if skuas without the assistance of man ever get a chance of taking the egg from an albatross nest. The normal routine during the incubation period gives no chance to skuas to swoop down and take eggs as the change-over by the parent albatrosses is a well-controlled affair; the sitting albatross remains faithfully on the nest for up to several weeks till its mate returns to take over the duties for a period. Only when man and his followers, dog or cat or a flock of sheep or cattle deliberately or accidentally force an albatross off the nest, will the ever-present skua get its chance. I consider it likely, although this is of course only speculation, that skuas on Campbell Island have increased in number since man's arrival. Man brought with him new sources of food for the skua; sheep and their lambs, remains of killed sheep, refuse from the sealing and whaling operations, and others. During my work with weighing eggs and banding sitting albatrosses it happened twice that the bird walked away from the nest after having been placed on the egg; on both occasions skuas appeared out of nowhere, hovering over the unguarded nest with its big, whitish, one-pound egg. By getting on to the windward side of the bird and slowly driving it back towards the nest, we managed to make it settle on the egg again. But it was evident that an albatross driven off its nest will have its egg taken by skuas, and several nests with egg-shells were evidence of such happenings.

Norway rats are plentiful, but they apparently never get a chance to steal an albatross egg, whereas in the rockhopper penguin colonies they take a number of eggs; on one occasion I saw a rat surrounded by shells from penguin eggs, which had been pulled in under a cliff. Sheep may occasionally force an albatross off the nest, but it is very unlikely; once I saw a sitting albatross having a skirmish with a sheep which doggedly remained standing right next to the nest. I did not see any cats or signs of cats on the island, but one was killed a couple of years ago.

Royal albatrosses are not true colony-breeding birds. Where forced to, as is the smaller northern royal albatross on islets off the Chathams, they may nest fairly closely together, but on Campbell Island nests were usually 20–50 yards apart; on two occasions I saw occupied

nests only 4 yards apart. A few pairs will nest quite a distance from other albatrosses.

REQUIREMENTS OF THE NEST SITE

The upper ridges and corries above the scrub-line are the nesting habitat of the royal albatross; this scrub-line where tussock takes over is not strictly determined by altitude, but is mostly found at about 400 feet. This level coincides with the lower layer of the fog, mist, and clouds frequently covering the ridges, so for much of their time on the nest the albatrosses sit in a misty eerie world.

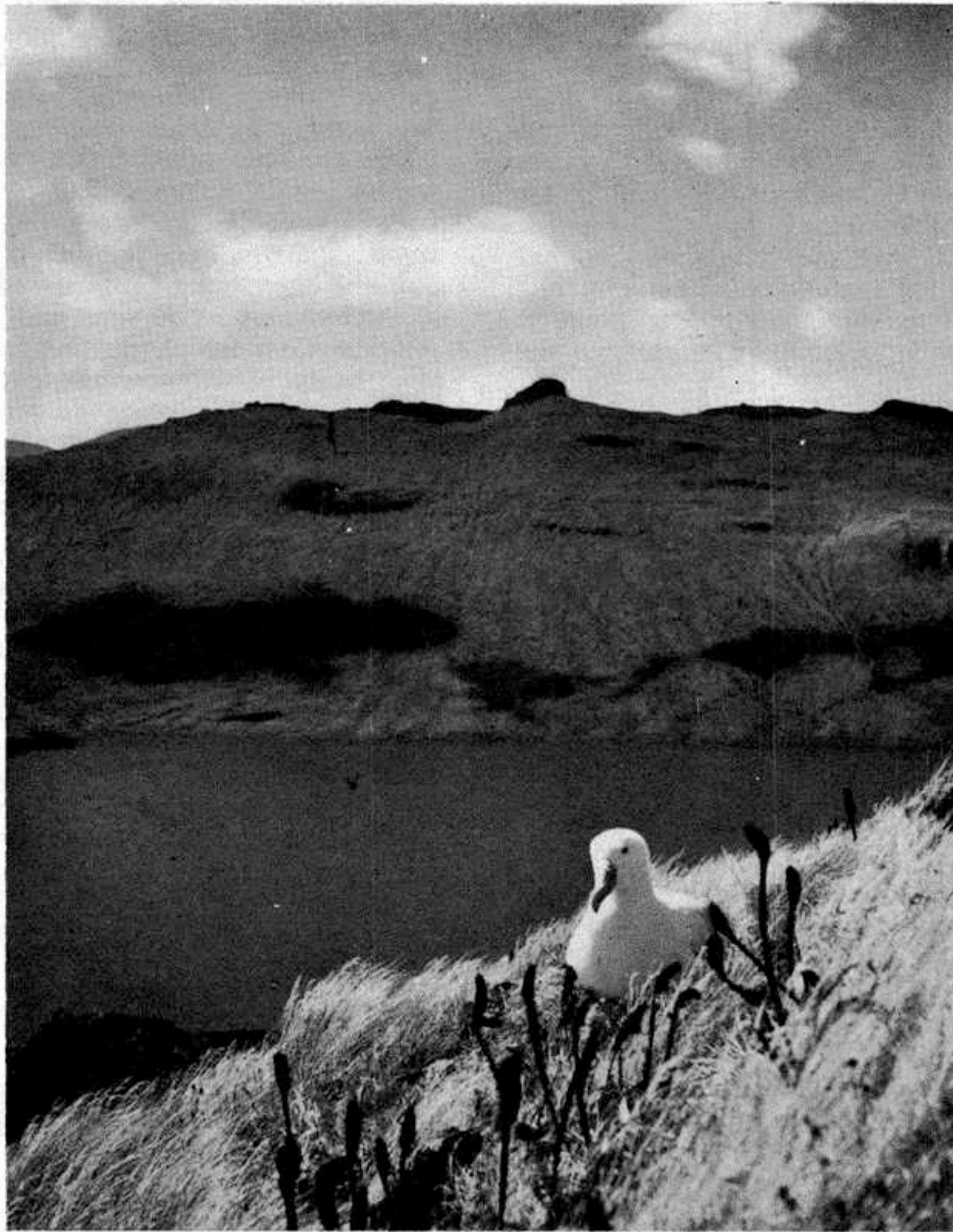
During my stay on Campbell Island I inspected well over a thousand nests in all parts of the island and plotted a total of 2,278 nests on my maps. Viewing all the collected material, certain main features of the nest site were prominent.

One characteristic feature is that all nests were placed on the leeward slopes of ridges, in corries, gullies and on partly protected plateaux, but no nests were observed on the windward slopes exposed to the strong westerly and north-westerly winds. I stress this point as Rankin (1951) who studied the wandering albatross on its nesting ground in South Georgia, at a slightly more southerly latitude, had this to say about the wanderer: "The nesting sites selected are invariably on the windward side of an island, fully exposed to bad weather." On several occasions I found single royal albatross nests on the top of hillocks, but the bird was invariably sheltered by the surrounding high tufts of tussock. On the five-mile western coast, from Northwest Bay to Courrejolles Point there was not one albatross nest on the exposed windward slopes. Everywhere on the exposed slopes, the vegetation is short and provides no shelter for a bird of the size of an albatross or its young. The centres of albatross nesting are the Faye and Fizeau Ridges, the plateau east of Mt. Lyall and Moubray Hill and the gently sloping plateau south-east of Mt. Honey. Also in these areas the albatross nests are placed in sheltered or partly sheltered positions, most of them in small gullies and corries. The resting or sleeping albatross on the nest sits with its head resting on the back and it will rarely be exposed to the wind. The main centres of distribution are to some extent exposed to the predominant winds which however have lost much of their strength against the protecting western ridges and peaks (Mt. Azimuth and Mt. Fizeau) and in the central and eastern part of the island the big protecting cones of Mt. Lyall and

Mt. Honey. On the plateau of Moubray Hill I noticed several nests which were built behind low scrub, measuring about 2 feet in height, so that the sitting bird was sheltered from westerly winds. In order to take off, the albatross waddles from the nest to the top of the nearest ridge, where after a short run into the wind, the bird is airborne. Where many albatrosses nest together, the birds going to and from their nests follow to some extent the same tracks, and regular albatross thoroughfares are very noticeable.

Practically all the nests are placed in tussock, the dominant species being *Poa litorosa*. Sheep have had a pronounced effect on the island's vegetation by eliminating the large tussock, *Danthonia flavescens*, and by restricting appreciably the distribution of the species of *Pleurophyllum*, *Anisotome* and *Stilbocarpa*. When sheep-farming was at its height early in this century, about 8,000 sheep were present on the island. The sheep station was given up in 1927, but there are still today probably near 2,000 sheep left. The grazing by sheep has badly denuded many areas; one species, *Chrysobactron rossii*, is never eaten by sheep, and this plant has accordingly spread widely. As its upper parts die over winter, the ground is partly bared and heavy winter rains cause some erosion and slips. Thus the presence of sheep causes a gradual deterioration of the island as an albatross nesting habitat, as albatrosses never nest in pure stands of *Chrysobactron*. Where this plant is still mixed with tussock, albatrosses will continue to nest. This was particularly pronounced in parts of the Faye Ridge where destruction by sheep has undoubtedly caused a lowering in numbers of nesting albatrosses; many nests were found here in apparently inferior nest sites, probably because the birds cling to this accustomed breeding ground.

The nest itself is a circular mound, measuring 3 feet in diameter at the bottom and about a foot high. Albatrosses make their nest by scraping with their beak a circular trench, heaping up the peaty soil and plant matter into the centre; they also tear tussock leaves, fern leaves and other material from the surrounding area, and the inner cup is lined with thin dry tussock. Nests are used for many years and the base may become solid peat. During the incubation period the sitting albatross continues to scrape the circular trench around the nest, adding the peaty soil to the nest mound. Whether some nests are used every year, i.e. by alternating breeding populations as the alba-



Royal albatross on its nest on the northern slope of Mt. Honey,
Campbell Island.

trosses breed only every other year, I do not know. But judging from the large number of unoccupied nests and also from the fact that some nests are occupied by big young birds when the new season birds arrive in the spring, I would consider it most likely that the two breeding populations use different nests. As quite often apparently new, low nests were found, it is evident that some of the albatrosses build new nests.

The nest cup lined with dry straw is always kept dry and although I examined eggs in several hundred nests, much of the time during rain or mist, I never found the nest lining or the egg wet. The egg must, however, receive much moisture from the peaty nest itself, and there can be no doubt that the humidity requirements of the developing albatross embryo are very high.

UNEMPLOYED BIRDS AND GAMS

Finally, there is one more necessary requirement of the albatrosses' nesting habitat: the resting, sleeping and loafing grounds of unemployed birds and the places for the pre-nuptial display activities of young birds, the so-called gams.

The unemployed birds—social as albatrosses are—congregate in certain areas; it was quite evident that a favourite meeting place was the ridge between the Lyall plateau and Moubray Hill, where several hundred birds were idling away time, some sleeping, some preening, some occupied in friendly bickering with neighbours. Other similar congregations were observed on the Faye Ridge and the plateau south-east of Mt. Honey. A much smaller assembly of unemployed birds was observed on the flat ridge below Menhir Peak. The birds in these groups are either non-breeding because they are too young, or have attempted to breed but have lost egg or young, or have lost their mate, or for some other reason are not engaged in breeding.

These albatrosses probably belong—at least for the main part—to that particular breeding population, as the alternate breeding population and the offspring raised by it are away from the island.

The gams vary in size from 2 or 3 up to 13 young (and maybe also some old) birds which spend endless hours facing one another, displaying, calling, sham-fighting and resting in between. Most of the gams take place near or in the nesting colonies and usually in a place where the vegetation is low; the tramping and resting of the birds for long periods tend further towards flattening the vegetation. The royal albatross does not breed till 8 or 9 years old, and the young birds spend their first years of life roaming the seas and along the South American coasts. According to Richdale (1952) the young albatrosses return to the breeding ground when 4–7 years old and yearly till they start breeding; while on these pre-breeding visits the young birds spend much time developing their abilities in displaying and fighting.

To sum up: Campbell Island is an ideal nesting habitat for its large population of royal albatrosses. The island's safety and conservation in its natural state is of paramount importance, not only nationally but internationally. The only danger at present threatening the welfare of Campbell Island's nesting albatrosses is the gradual deterioration of the vegetation and accompanying soil erosion, as a result of the grazing of a large population of wild, un-exploited sheep. A recommendation for the removal of these sheep is now being considered by the Government Departments concerned.

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