

HENDERSON ISLAND, CENTRAL SOUTH PACIFIC, AND ITS BIRDS

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ABSTRACT

The ecology of Henderson Island, a raised atoll near Pitcairn Island on the southern border of Oceania, still seems to be in its natural state. The birds include an endemic monotypic genus of flightless rail, an endemic species of parrot, and endemic races of fruit pigeon and warbler. Its seabirds have not been adequately studied but are known to include a large population of the rare dark phase of the Herald Petrel. The White Tern may be an endemic race with white feet. The island has been under consideration for the construction of a holiday home with an airstrip.

Henderson or Elizabeth Island is a raised atoll up to 30 m high and about 40 km² in area located in the centre of the South Pacific at 24°22'S, 128°18'E, 177 km ENE of Pitcairn Island and about 5000 km from the main land masses to the east and west. Its terrain is so difficult, consisting of often deeply fissured coral rock covered in impenetrable scrub that, although it has been visited intermittently by man for nearly a millenium, nobody has stayed for long and it is now one of the few islands of its size in the warmer parts of the world still little affected by human activity, supporting a variety of endemic plants and animals and important seabird colonies in an area with few alternative sites. Its history has recently been reviewed by Heffernan (1981), its botany by St John & Philipson (1962), and its ornithology by Williams (1960), but as there is still some important unpublished information it may be useful to review its ornithological history now that permanent settlement is under consideration (Belstead 1983).

HISTORY

The island was apparently occupied, at least intermittently, for several centuries by Polynesians and then abandoned before it was first recorded on 29 January 1606 by Pedro Fernandes de Quiros, who named it San Juan Bautista (Markham 1904; Sinoto, in press). It was rediscovered in 1819 by Captain James Henderson in the *Hercules*, followed by Captain Henry King in the *Elizabeth* (Maude 1951), who provided additional names. It achieved notoriety when it was visited on 20 December 1820 by the shipwrecked crew of the whaler *Essex*, which had been sunk by the prototype of Moby Dick. They found little food or water, and after a week sailed on to start

eating one another, leaving three wiser companions, who were rescued by Captain Thomas Raine in the *Surry* on 9 April.

According to the records of the British Hydrographic Department (The Pads PC3), the island was examined again by Captain F. W. Beechey (1832) in HMS *Blossom* in November 1825 and by Captain Jenkins Jones in HMS *Curacao* on 17 August 1841. Pitcairners first investigated it, apparently, in the whalers *Joseph Meigs* and *Sharon*, when they were looking for a refuge for their surplus population in August and November 1851 (Murray 1860), but they found it too barren for settlement, although they have continued to visit it at intervals to obtain miro (*Thespesia populnea*) wood for carving. The *Allan Gowie* was wrecked in 1877, and the survivors were picked up by a passing vessel trying to reach Pitcairn. The island was first prospected for guano in 1881, but only about 200 tons could be located (Maude 1951). In July 1902, the island was officially annexed by Britain and a few coconuts were planted, and in September 1907, it was visited by a party including John T. Arundel and George Ellis of the Pacific Phosphate Co. in SS *Tyrian* in search of guano (analysis in Hutchinson 1950). A. E. Stephen of this party collected six birds with a revolver for the Australian Museum, subsequently described by North (1908) as three new species, a parrot *Calliptilus stepheni*, a pigeon *Ptilinopus insularis*, and a rail *Porzana atra*.

In 1908 James Banks and James Watt obtained an official licence to prospect for phosphate but found the island too large to be covered in the time available. A Henderson Island company, set up with Sir John Murray as chairman, sent another team led by Banks to explore the island more thoroughly in July-November 1912 (Tait 1913). They installed corrugated-iron huts at the northern landing place and cut paths, first SSE across the island and then out from this to both coasts, finding the old diggings by Ellis in the process. Although they found about 500 tons of phosphate in the north-west, north-east, and south of the island, they concluded that exploitation would not be economic, and after taking 5 tons of sandalwood, they abandoned the lease the following year. Some collecting was undertaken by D. R. Tait (MacGregor 1948) and J. R. Jamieson, and the plants were sent to the Royal Botanic Gardens, Edinburgh, and the animals to the British Museum (Natural History). The birds were taken between 21 October and 7 November, and three new species were described by Ogilvie-Grant (1913 a, b), of which the warbler *Acrocephalus taiti* was new, and Smith (1913) reported the presence of a rich marine mollusc fauna.

The island was explored again by the Whitney South Sea Expedition of the American Museum of Natural History in 1922, when R. H. Beck (1923) collected birds offshore and E. H. Quayle and C. C. Curtis sought animals and plants respectively on land, collecting 90 bird specimens and making copious notes. H. St John and F. R. Fosberg also visited the island during the Bishop Museum Mangareva

Expedition on 17-22 June 1934, when much the same birds were seen (F. R. Fosberg, *in litt.*). The results of these activities have appeared in many specialised publications, including, in addition to those already mentioned, accounts of spiders (Berland 1942), ants (Wheeler 1936), and beetles (Zimmerman 1936).

In August 1937, the island was re-examined and found unsuitable for an air staging post by Captain Rivett Carnac in HMS *Leander*, and further visits are said to have been made by United States parties in 1944 and 1966. During 31 July-10 August 1948 an automatic light was installed with some difficulty by Captain G. S. Webster in HMCS *Awahou*, but it was eventually abandoned in 1954. Further scientific surveys were made by W. H. Lintott of the University of Canterbury, Pastor L. Hawkes, and a party of Pitcairners in February 1957 (Williams 1960) and by Y. H. Sinoto and J. E. Randall of the Bishop Museum with M. A. Rehder of the Smithsonian Institution in January 1971 (Rehder & Randall 1975; Sinoto, *in press*). During 1957 the island was also visited by R. Tomarchin with a chimpanzee named Moko, and in 1981 by F. M. Ratliff who wants to construct a house and airstrip (*Washington Post Magazine* 18 April 1982, *Washington Post*, and *The Press*, Christchurch, 29 January 1983).

THE ISLAND

The island was identified by Beechey (1832) as an atoll raised about 30 m above the sea surface and surrounded by about 200 m of new reefs. Murray (1860) and North (1908) remarked how the dry bed of the old lagoon was still covered with fragments of coral and sea shells, although the old fringing reef was already eroding to form dangerous crevasses. After a thorough survey, Tait (1913) reported that "on reaching the top . . . the first thing to attract attention is the apparent flatness of the land. From a point 400 m behind the (northern) settlement the spray on the extreme south point 8 km distant can easily be seen. If anything the north side is steepest with a scarcely perceptible dip to the inside. The highest rocks were seen on the northwest and west sides. To the southwest, south and southeast there was bad going over rocks about 1 m high. Generally the east side was the best going with little rough country; the northeast was rough with large flat pieces of coral showing at the surface." Phosphate was found in scattered nodules in layers of earth, sand and gravel on and between pinnacles of limestone on both the west and east sides of the island. Trees up to 7 m high grew here, although elsewhere the scrub was often no more than waist high. Unfortunately his map and meteorological records have not been found.

Detailed notes were also made during the Whitney expedition (1922) by Quayle, who spent his time camping ashore. He reported that the peripheral cliffs contain two horizontal lines of caves, which may represent old raised shorelines, and that inside the few beaches some coconuts have been planted and there is a tangle of native vegetation below the old reef face, which is covered in long ferns.

with more dense scrub and sometimes thorny creepers on top. After 300 m these "badlands," which have deterred most visitors, give way to sandy flats strewn with old lagoon corals, with occasional belts and knolls of reef-rock and groves of tumbled pandanus and other trees with trunks up to 500 cm in diameter, where there was more wildlife and travelling was easier, apart from a tendency to get lost.

It appears from these accounts that the island must have been elevated rather recently. There has thus been little time for soil to form, although there are already many endemic plants and animals and the coasts are beginning to erode, especially where they face the south-east trade winds. With so much vegetation, a considerable rainfall seems likely, which has doubtless tended to wash away guano before phosphate could form. No standing water accumulates on the porous rock inland, but water has sometimes been reported seeping through the roofs of the coastal caves and some visitors have found a spring in the northern intertidal zone.

The four landbirds have traditionally been treated as an endemic monotypic genus of rail, *Nesophylax ater*, derived from the Spotless Crake (*Porzana tabuensis*), which is widespread in Oceania, an endemic species of parrot *Vini stepheni* and races of pigeon *Ptilinopus purpuratus insularis* and warbler *Acrocephalus vaughani taiti* belonging to equally widespread but more variable superspecies, and we have followed this here. Note, however, that in the latest monographs by Ripley (1977), Forshaw (1973) and Goodwin (1970), the first three are all treated as endemic species. It seems likely that they have evolved in rather a short time from the most likely colonists to reach the isolated and highly peculiar island environment, and a comparative study of their evolution would be useful.

Most of the interested visitors have found the landbirds, but the list of seabirds still seems incomplete, possibly because the colonies are hard to find in such awkward terrain and few people have been there at the right season. As a result, some groups involving sibling species have to be treated collectively in the following list. Evidence for annual cycles is only fragmentary, provided by visits by Stephens in September 1907 (North 1908), Tait and Jamieson in July-November 1912 (Ogilvie-Grant 1913 a, b), the *Essex* castaways in December 1820 (Heffernan 1981), Hawkes in February 1957 (Williams 1960), and the Whitney expedition in March and April 1922, subsequently referred to by name or date for brevity. Most birds seem to breed in the local spring but the pigeons may do so in the autumn, and some species such as the tropicbirds seem to nest continually.

Quayle noticed a few northern shorebirds and turtle tracks on the beaches, and many kiore (*Rattus exulans*), lizards and geckos, four small moths, a beetle, black ants, blowflies and a smaller fly inland, and North (1908) reported the presence of a small butterfly in the spring. The rats were probably imported by the Polynesians. It appears from Quayle's notes that the three goats whose liberation

was recorded by Beck (1923), leading to a protest by Maillard (1923), were in fact released by the crew, and luckily nothing further has been heard of either them or pigs imported with less comment in 1912.

THE BIRDS

Gadfly petrels *Pterodroma* sp.

A. E. Stephen reported that in September 1907 "mutton birds were plentiful, and laid eggs on the ground among scrub in secluded places all over the island." He also photographed a chick. In March and April 1922, the Whitney expedition found that scores of birds came to display, although they apparently saw no other evidence of breeding, which was taking place at Oeno atoll 200 km WNW and Ducie 320 km ESE. "Neglected Shearwaters" apparently occurred, mainly soaring over the sea cliffs in the daytime, whereas dark "Henderson Shearwaters," which were rare elsewhere, dispersed inland to circle over the scrub in pairs at dusk, repeating *clack clack clack clack clackety tack tack tack tack* rapidly and settling at possible nest sites under cover. Quayle had some difficulty deciding whether the small minority of white-breasted birds of a type which predominated elsewhere were using the same call but eventually concluded that they were.

Their many specimens were discussed by Murphy & Pennoyer (1952; see Table 1), who concluded that they belonged to three species, most being the dark phase of the Herald or Trindade Petrel (*P. arminjoniana heraldica*), smaller numbers of the Kermadec Petrel (*P. n. neglecta*), a high proportion of them pale birds, and one white-breasted Phoenix Petrel (*P. alba*), of uncertain status because it apparently occurred among a number of birds taken at sea on the evening of 17 March. Apparently they did not find Murphy's Petrel (*P. ultima*), which was found breeding alongside the other species on Oeno and Ducie.

Re-examination of the same and further specimens confirms their general conclusions. In addition, however, some birds from Ducie, which resemble *P. neglecta* in their dimensions, show markings usually more characteristic of *P. arminjoniana* or of *P. alba* when each occurs on its own. Therefore, when they occur together, they may perhaps occasionally hybridise. This may also occur at Uapu Island in the Marquesas, where the Whitney expedition found *P. arminjoniana* breeding alongside *P. alba* in September and October 1922, and at the Kermadec Islands, where slightly aberrant examples of *P. alba* have been reported from the colonies of *P. neglecta* (Oliver 1955; Bourne 1975; see Table 2).

Shearwaters *Puffinus* sp.

Although shearwaters have been reported to breed, the only definite evidence seems to be the collection of one Wedge-tailed Shearwater (*P. pacificus*) offshore at dusk by R. H. Beck on 17 March 1922.

TABLE 1 — Proportions of gadfly petrels and their morphs on different islands in the Pitcairn group

	Oeno		Henderson		Ducie	
	Morphs	Total	Morphs	Total	Morphs	Total
Kermadec Petrel (<i>Pterodroma n. neglecta</i>)						
Light	36 (46%)	79 (58%)	5 (33%)	15 (20%)	6 (30%)	20 (42%)
Intermediate	19 (24%)		7 (47%)		8 (40%)	
Dark	24 (30%)		3 (20%)		6 (30%)	
Herald Petrel (<i>Pterodroma arminjoniana heraldica</i>)						
Light	42 (95%)	44 (32%)	5 (9%)	58 (78%)	22 (100%)	22 (46%)
Dark	2 (5%)		53 (91%)		0	
Phoenix Petrel (<i>Pterodroma alba</i>)						
All light		14 (10%)		1? (1%)		6 (12%)

Note: The proportion of morphs in each population is given first, and then the proportion that the species forms of the specimens from the island. The names Herald and Trinidad Petrel have about equal standing for the Pacific and Atlantic races of *P. arminjoniana* but considerable confusion has been caused by the different spellings used for the latter, which is apparently Trindade in Brasil, which owns its island breeding-place. Derived from Murphy & Pennoyer 1952.

It seems likely that the Christmas Shearwater (*P. nativitatis*), which Williams (1960) found incubating on Oeno atoll in October 1956, may breed as well.

Tropicbirds *Phaethon* sp.

Owen Chase (*in* Heffernan 1981) mentioned tropicbirds as being found breeding by the castaways from the *Essex* in December 1820. Beck reported that eggs and young of the Red-tailed Tropicbird (*P. rubricauda*) were found along the top of the cliffs in March and April 1922, and a White-tailed Tropicbird (*P. lepturus*) was seen off Ducie Island on 13 April. Williams (1960) was informed that the latter occurs at Henderson Island.

Boobies *Sula* sp.

On 29 October 1912, Tait and Jamieson collected a Red-footed Booby (*S. sula*) in the *nicolli* phase, which has a grey body and white tail, and Beck reported that a few of this form with occasional white birds were seen flying inland at dusk in 1922, when seven were collected. Williams (1960) was informed by L. Hawkes that Blue-faced Boobies (*S. dactylatra*) also had young on bare patches of ground behind the coast in February 1957 and that Brown Boobies (*S. leucogaster*) were present.

Frigate-birds *Fregata* sp.

Frigates were reported as common by both Stephen in 1907 and Hawkes in 1957. Beck recorded that many could be seen sailing along the shore and settling in the bushes behind it, where a male was seen to inflate his gular sac, but Quayle reported that many were immature. Nine Greater Frigate-birds (*F. minor*) were collected.

REEF HERON *Egretta sacra*

Both Beck and Quayle recorded the presence of a white heron on the shore during 3-9 April 1922.

HENDERSON RAIL *Nesophylax ater*

This large black representative of the Spotless Crake (*Porzana tabuensis*) with a reduced wing and big legs (Murphy 1924 a, b) was discovered by A. E. Stephen in 1907. Stephen reported that they were fairly plentiful inland, where they were rather tame and would come up to visitors, although they could run fast without flying, and he speculated that they fed on the numerous small terrestrial molluscs. Tait and Jamieson (Ogilvie-Grant 1913 a, b) took two small chicks on 21 October 1912, whereas the Whitney expedition found large young and moulting adults in March and April 1922. Quayle recorded that the bird was still fairly common in 1922 and preferred to feed in the densest ground litter inland, where it would scratch like a chicken. If disturbed, it would run a short way and then stop to look back, but it did not fly, even when chased by dogs, and was liable to sneak up on visitors from behind. It was the first bird to start calling in the morning, the adults using a clattering call not unlike a shear-

water and the younger birds a sharp *clackety clack*. They collected 24 skins and three pickled specimens.

BRISTLE-THIGHED CURLEW *Numenius tahitiensis*

Two birds were collected on 10 April 1922 (Stickney 1942), and others were seen.

WANDERING TATTLER *Tringa incanus*

Birds were collected on 31 October 1912 (Ogilvie-Grant 1913 a, b) and on 18 March 1922 (Stickney 1942), when more were seen in April.

TABLE 2 — Characters of the *neglecta-arminjoniana-alba* group of gadfly petrels of the genus *Pterodroma*

Specimens	Wing	Tail	Culmen	Tarsus	Markings
36 normal Kermadec Petrels (<i>P. neglecta</i>)	292	106	30.5	39.2	Uniform, finely barred head and neck, white patch on primaries
44 normal Herald Petrels (<i>P. arminjoniana</i>)	284	114	28.0	35.2	Pale face, mottled zone on breast, pale primary vanes
18 normal Phoenix Petrels (<i>P. alba</i>)	278	113	27.6	33.6	Dark back, head, neck, wing; pale chin, white belly, streaked flanks
<i>neglecta</i> × <i>alba</i> ?					
Sunday I. 7/ 3/13	277	113	28	33.5	<i>alba</i> , flecked flanks
Raoul I. 20/ 8/44	293	100	30	38	<i>alba</i> , dimensions <i>neglecta</i>
Ducie I. 22/ 3/22	294	103	30	38	<i>alba</i> , mottled belly
Ducie I. 20/ 3/22	286	102	30	38	whiter belly and vanes
Ducie I. 22/ 3/22	286	98	31	38	<i>alba</i> , white primary patch
<i>neglecta</i> × <i>arminjoniana</i> ?					
Ducie I. 3/ 1/35	281	102	31	40	White face, fine barring on breast, pale primary vanes
Ducie I. 28/ 3/22	276	106	31	39	Mottled breast, pale primary vanes
Ducie I. 22/ 3/22	277	87	31	39	Dark phase, paler chin, pale primary vanes
<i>arminjoniana</i> × <i>alba</i> ?					
Uapu I. 14/ 9/22	283	115	29	34	<i>arminjoniana</i> , dark wing
Uapu I. 31/10/22	275	110	29	36	<i>alba</i> , pale primary vanes
Uapu I. 14/ 9/22	279	110	26	34	<i>alba</i> , but whiter throat and primary vanes

Note: Birds in American Museum of Natural History, except that from Raoul I. in National Museum, Wellington. That from Sunday I. is the type of *Oestrelata oliveri*. While the morphs of *P. neglecta* and *P. arminjoniana* vary in the intensity of marking on the head, neck and underparts, the main characters remain constant. A white patch on the primaries, normal in *P. neglecta*, includes the shaft, whereas *P. arminjoniana* normally has the inner vane pale but the shaft dark and *P. alba* has the whole primary much darker. Measurements include average for series of normal birds and given in mm.

SANDERLING *Calidris alba*

Two were collected on 2 and 4 November 1912 (Ogilvie-Grant 1913 a, b), and Quayle saw two possible birds on 18 March 1922.

Noddies *Anous* sp.

A White-capped Noddy (*A. minutus*) collected on 7 November 1912 (Ogilvie-Grant 1913 a, b) is in the British Museum (Natural History). Beck saw unspecified noddies going inland at dusk in 1922, when one White-capped Noddy and three Common Noddies (*A. stolidus*) were collected. Quayle did not report many ashore, apart from one bird with an immature in a pandanus inland on 8 April.

WHITE TERN *Gygis alba*

A. E. Stephen saw birds nesting on both trees and rocks and obtained an egg in September 1907. The Whitney expedition collected adults and immatures in March and April 1922, when both Beck and Quayle remarked that the old birds differed from all others seen in having white feet with dark nails, Quayle adding that the immatures had bluish toes. A specimen in the BMNH, collected on 29 October 1912, has sandy-yellow feet with dark claws, although the label reports normal colours (P. R. Colston, *in litt.*). Holyoak & Thibault (1976) have described the White Tern from Ducie and Henderson as *G. a. leucopes*.

GREY TERNLET *Procelsterna albigitta*

Tait and Jamieson took one on 1 November 1912. A flock was seen fishing off the north-east point by the Whitney expedition on 17 March 1922, and birds were collected roosting in the cliffs that evening, and again in April.

HENDERSON FRUIT PIGEON *Ptilinopus purpuratus insularis*

The local race is larger and brighter than *P. p. coralensis* of the Tuamotus, and allies occur throughout Oceania (Ripley & Birckhead 1942). The Whitney expedition found that, unlike other species, they were scattered and calling freely in March and April 1922. Quayle reported that the male has a coarse *coo* and cavorts around the female like a domestic pigeon. The birds usually ignored attempts to call them down, but on one occasion an apparent immature settled within 2 metres. They appeared to be feeding on a berry like a crab-apple with a large stone. In contrast, in September 1907 Stephen reported that they were in flocks of up to 20 and presumably not breeding.

HENDERSON PARROT *Vini stepheni*

This brightly coloured representative of a widespread group (Amadon 1942) does not seem to have been seen closely by most visitors, but Quayle reported that, although they were usually seen flying over in pairs around the larger trees, using the same shrill croak as Rimitara parrots (*V. kuhlii*), they could be called down, and one settled within a metre.

HENDERSON WARBLER *Acrocephalus vaughani taiti*

Stephen reported the presence of a "small brown bird with white tail feathers, similar to the one on Pitcairn," but he failed to collect it. When he described the local form Ogilvie-Grant (1913 a) remarked that, although both varied, this population differed from that on Pitcairn in having the feathers of the head uniform brown, without yellowish-white edges. Beck also noted that many old birds had white feathers in the wing and tail. Quayle found that they were very common and tame and that, in the field, they were small silent green warblers, hopping about searching for insects in the foliage and ground litter. They did not normally sing like the large yellow birds of the Society group, but sometimes used a shrill chirp in the evening and could be attracted by squeaking noises. The voice is apparently similar on Pitcairn, where they were found breeding in October and November 1956 by Williams (1960), who discussed their character at length. Two further races in more normal plumage have recently been described by Holyoak (1974) from the Cook group.

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SHORT NOTES

DECLINE OF THE PIED STILT IN CENTRAL OTAGO

Over recent years we have noticed a marked decline in the populations of the Pied Stilt (*Himantopus h. leucocephalus*) throughout Central Otago, particularly in the districts centred on Alexandra. Many habitats previously supporting good breeding populations, generally of 10-20 pairs, are now deserted, as are some of their traditional feeding haunts; this in spite of greater potential feeding habitat resulting from increased acreage of irrigated pastures.

Breeding success has also been very low in recent years, and I suspect that one reason for this is increased predation of both eggs and young by feral cats, stoats and ferrets, the ubiquitous Black-backed Gull (*Larus dominicans*) and Harrier (*Circus approximans*), and the gradual build-up of the White-backed Magpie (*Gymnorhina tibicen hypoleuca*) in this district. This is particularly true on the smaller riverbeds such as the Manuherikia, where access to nesting islands and terraces is fairly easy for predators when rivers are low.

Perhaps a more important factor, and one which gives predators an advantage, has been the steady decline in quality and quantity of nesting habitat on riverbeds, caused by the gradual encroachment of the usual adventive weed species — willow, broom, gorse, briar and lupin. Again the smaller riverbeds are particularly susceptible to this type of deterioration; extensive stretches of the Manuherikia, Lindis,