

On the status of the Christmas Island sandpiper, *Aechmorhynchus cancellatus*

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Introduction

Two species of sandpiper have been named and ascribed to the genus *Aechmorhynchus*, *Tringa cancellata* Gmelin, 1789, and *T. parvirostris* Peale, 1848. The first is known only from the lost type, considered to have been collected on Christmas Island, Pacific Ocean, on 1 or 2 January 1778 during Captain Cook's last voyage. This specimen was figured by William Ellis in a painting [no. 64] in the Natural History Museum, London. The accepted date of collection is presumably based on the fact that Ellis's painting was dated 1778, and Cook left the island on 2 January. No other specimens have ever been seen on or around Christmas Island. *T. parvirostris* was described by Peale on the basis of specimens collected by the U.S. Exploring Expedition in the period 1838–42 in the Tuamotu Archipelago. It had not been seen for a number of years prior to its rediscovery by the Moser Expedition 1899–1900, and subsequently by R. H. Beck in 1921. The problem is whether the Christmas Island population was of the same, or a different, taxon to that of the Tuamotos. (Throughout this paper the name *Aechmorhynchus* will be used, although the genus has recently been considered congeneric with *Prosobonia* (Zusi & Jehl 1970).)

Stresemann (1950) and others who have examined Ellis's plate of the Christmas Island bird concluded that it was probably the same as the Tuamotu population, and this was accepted by Greenway (1958) without further enquiry. Seebohm (1888) merged *parvirostris* in *cancellatus*, but Townsend & Wetmore (1919) separated them on the grounds that the description of the latter by John Latham (1785) states that the bill was one inch (26 mm) long and the underparts were barred, whereas of the four available specimens of *parvirostris* the longest bill was only 18 mm and the underparts were unmarked. Zusi & Jehl (1970) were of the opinion that these distinctions do not in fact apply, on the grounds that bill lengths given by Latham are often imprecise and therefore the length of one inch does not necessarily indicate a longer bill in *cancellatus*. Similarly, barring on the underparts of *parvirostris* is variable and cannot therefore be used as a distinguishing feature. They therefore dismiss *parvirostris* as a synonym of *cancellatus*. However, it is not as simple as that.

The problem

Christmas Island is approximately 2000 miles from the Tuamotos. It seems unlikely that two sedentary populations of a sandpiper would occur on these two groups, and on no others in the South Pacific, without having diverged to some extent. There are therefore several possibilities to be

considered: (1) The two populations were identical. (2) The two populations differed. (3) There never was an endemic population on Christmas Island, the single specimen was in fact a vagrant. (4) The locality is an error, and the specimen was not collected on Christmas Island at all, but in the Tuamotos. (5) The species formerly occurred widely in the South Pacific, but in historic times had been rapidly decimated, and was practically extinct on Christmas Island by the time of Cook's visit. Possibility 5 (which follows on from 1) is not provable except by the discovery of bones on Pacific islands which could be attributed to this taxon. 3 seems unlikely, but again is not capable of proof. 4 can also be dismissed, as Cook did not visit the Tuamotos on the third voyage.

The specimens

The type of *cancellatus* was brought back safely to Britain and passed into the Banksian Collection where Latham saw and described it as the "Barred Phalarope":

Length 7 inches and a half. Bill one inch, black: the feathers on the upper parts of the bird brown, edged with white: under parts white, transversely barred with dusky: quills dusky, with the ends brown, and the margins and tips very pale: tail the same, spotted on both webs with white: legs dusky. Inhabits Christmas Island. In the collection of Sir Joseph Banks.

This description was the basis of Gmelin's name. The subsequent fate of the specimen is unknown. Lysaght (1959) says that the length of the bird as given by Latham ($7\frac{1}{2}$ inches) agrees neither with Ellis's plate nor with a manuscript description by William Anderson.

Ellis's painting of *cancellatus* depicts a bird closely related to *parvirostris* but with shorter hind toes. The underparts are much paler than in the five NHM specimens of *parvirostris*, but the most striking difference is the head pattern: *parvirostris* has a white superciliary stripe, very thin or absent in front of the eye and most prominent behind it; *cancellatus* has no white stripe behind the eye, but a very broad prominent one in front of it.

Peale's (1848: 235–6) description of *parvirostris* states that the bill is green, black at the tip, the legs olive green and the irides brown. The females paler than the males. Peale found it common on Dog Island, rare on Raraka. He said that there is a superciliary line which is nearly white. Cassin (1858) revised Peale's work a decade later, and added plates which were intended to (but did not) accompany the earlier work. His plate of *parvirostris* depicts a nondescript sandpiper with no very distinctive features. There is a faintly pale area before, behind and under the eye, with a faint dark streak from the eye to the base of the bill, the throat is pale with barring commencing on the chest and continuing on the flanks. The back and wings are brown with pale edges to the feathers, the primaries have less pale edges. The tail feathers are brown with some white barring on the edges of the outer webs. The descriptions of Peale and Cassin do not disagree with the plate.

P. R. Lowe (1927) examined and discussed *parvirostris*. He pointed out that the flying capacity of *parvirostris* had not degenerated at all; it had full powers of flight, which Lowe considered remarkable for a wader which

was sedentary and confined to a single archipelago. This suggests the possibility that the bird was formerly more widely distributed. Lowe suggested that because the Bristle-thighed Curlew *Numenius tahitiensis* was first collected by Peale in the same place as *parvirostris*, the latter may originally have had a similar distribution. But there is no known instance of a migratory bird abandoning migration and settling down to a sedentary existence in one of its two abodes. Lowe considered that the characters of *Aechmorhynchus* were primitive and rather ralline in nature, and suggested that it was from an older group than most of the rest of the waders. This view has not been generally accepted.

The islands and their ornithological history

Christmas Island is a low coral lagoon, discovered by Captain Cook on Wednesday 24 December 1777. He remained there till 2 January 1778, naming the island for the season (Findlay 1886). The island is 35 miles long, and 14 miles wide at its greatest width. The lagoon is very shallow, and has now largely silted up, leaving a large tidal basin at the western (leeward) side, an area of islets in the middle, and a large flat area with many small lakes in the east. The island is very low (formerly no more than 10 feet above sea level) but there are now a number of sand dunes up to 40 feet high. The water table is often very near the surface, which makes travel hazardous, and causes flooding in wet weather. The soil is calcareous sand, often covered with mud, or a hard pan or crust of coral mud. The island is only 2 degrees north of the equator, and there is little seasonal change in climate (Gallagher 1960). When discovered, the land was covered with stunted bushes, and a few palm trees. Cook planted yams and melons. He also dug without success for water, but subsequent visitors found that very inferior water could be obtained (Findlay 1886).

There is apparently archaeological evidence that the island was visited in early times, but there is no indigenous human population (Gallagher 1960), and the island was certainly not inhabited at the time of Cook's visit. There is difficulty in interpreting the changes to the fauna that may have occurred since then. Remarkably little has been written about the island, particularly in the early years, and there is no further account until that of Bennett (1840). Cook commented on the birds as follows:

Under the low trees above-mentioned, sat infinite numbers of a new species of tern, or egg-bird. These are black above, and white below, and with a white arch in the forehead [Sooty Terns]; and are rather larger than the common noddy . . . There were also a good many common boobies, a sort that are almost like a gannet [Blue-faced Booby]; and a sooty or chocolate coloured one, with a white belly [Brown Booby]. To this list we must add men-of-war birds; tropic birds; curlews; sandpipers; a small land-bird like a hedge sparrow [the endemic warbler]; land crabs; small lizards; and rats.

F. D. Bennett visited the island in the whaling ship *Tuscan* in May 1835, and gave an account of the island in his travels (1840). Unfortunately King (1955) appears to have totally garbled Bennett's account, claiming that the latter saw sooty terns, pure snow white petrels, frigate

birds and petrels, among others. Bennett's account mentions none of these. Furthermore the "quail" listed briefly by Bennett is interpreted by King as referring to wintering Golden Plover, but this seems unlikely, as Bennett specifically states that it is a land bird. It may therefore have been a small rail, totally unknown to science. King's account is repeated by Gallagher (1960). Much more to the point, Bennett makes no mention of any endemic sandpiper, which had probably disappeared by that time, possibly a victim of the rats which were already present in Cook's time. This, however, cannot be proved. It is not clear what species of rats are here involved. Gallagher saw at least two species (but did not trap any), a small grey one which he thought was probably the Polynesian Rat *Rattus exulans*, and another large rufous one which he did not identify, but which may have been the Brown Rat *Rattus norvegicus*. (Mrs. Elizabeth Schreiber, pers. comm., advises me that this larger species of rat is no longer to be found on the island.) It is most likely that the rat present when Cook arrived was *exulans*, introduced by the Polynesians, which seems to do relatively little damage to bird populations. There is as yet no known instance of the extinction of any bird species as a result of predation by *R. exulans*. Atkinson (1985) indicates that there is no evidence for the existence of any rat other than *R. exulans* on any island in the central Pacific prior to 1850; after that date all three species (*R. exulans*, *R. rattus* and *R. norvegicus*) were widely, but irregularly, distributed. Atkinson does not specifically mention Christmas Island, and no information seems to be available on dates of rat introduction.

King's assessment of Bennett's account is so poor that he lists "other terns" and suggests that these are "probably noddies". Not only are these terns quite clearly the Blue-grey Noddy *Procelsterna cerulea* but King has overlooked the fact that Bennett gave a detailed description of them and actually named this species for the first time, type locality Christmas Island! As Bennett's account is of some importance in establishing his accuracy, it is here discussed. Bennett's ship reached Christmas Island on the afternoon of 6 May 1835. He describes a booby, clearly *Sula dactylatra*; the Red-tailed Tropic bird *Phaethon phoenicurus* (now *P. rubricauda*); the "snowy tern" is obviously *Gygis alba* for he describes it laying eggs on bare branches; and the Blue-grey Noddy. He also found "curlews" numerous on the coast. He is absolutely accurate in all the birds which he describes. However, the fact that he omits any mention of several species which must have been present, means that we cannot be certain that the sandpiper had died out by that time.

The next recorded visit seems to have been that of the lumber barque *J.C. Fremont* which was wrecked in the large bay on the east of the island in November 1857. In 1858, Captain Hooper examined it, reporting that a number of wrecks had occurred in that dangerous bay. He noted that the lagoon was extremely salty and that all the fish in it appeared to be dead, but remarkably preserved, and quite edible, the excessive salt appearing to act as a preservative (Hooper, in Findlay 1886).

The first ornithological visit to Christmas Island which systematically collected and reported on the birds was by Streets (1877), who visited it in a January during the course of the 1873-5 United States North Pacific Surveying expedition. He listed 9 species:

Numenius femoralis, i.e. *tahitiensis*. A few seen but not collected.
Sula piscator, i.e. *S. sula*. Sitting on eggs in January.
Sula cyanops, i.e. *dactylatra*. Breeding, one immature collected.
Fregata minor. Not breeding and not very common.
Phaethon rubricauda. Breeding. 2 specimens collected, one an immature.
Anous stolidus. Breeding.
Puffinus nativitatis. One specimen, captured on its nest.
Pterodroma parvirostris. Breeding. 2 specimens collected.

The list is interesting not only for what it includes, but for what it omits. There is, for instance, no mention of the endemic warbler.

Gallagher (1960) lists a total of 32 species recorded from the island. It is clear that the failure to mention a particular species in one of the early accounts cannot be taken as incontrovertible evidence that that species was not in fact present.

A. parvirostris is widely distributed in the Tuamotu Archipelago, and is not confined to Honden and Raraka, as was stated by earlier writers. It occurs in every type of habitat the islands afford, commonly on stretches of bare ground, and less commonly in dense pandanus thickets. Islands on which the sandpiper has been recorded include the Mangareva group, the Actaeon group southwest of Mangareva, and the central Raeffsky group (Greenway 1958). Holyoak (1973) points out that *A. parvirostris* occurs only on islands free of men, cats and rats. The Mangareva or Gambier Islands consist of an encircling coral reef enclosing five large and several smaller islands. All the islands of the group are steep and rugged, and volcanic in origin. They are fertile and have fresh water. The Amphitrite or Actaeon Islands are low wooded islands, apparently with fringing reefs, and when discovered in 1833, were uninhabited. The Raeffsky Islands are three small islands, very close together and almost connected. Honden or Dog Island when discovered in 1616 was clothed with vegetation and almost covered with water at high tide. It appears to have been uplifted since that date. It is now a coral lagoon which only communicates with the sea at very high tides. Raraka is a thickly wooded coral lagoon. Fakarava is a large coral lagoon, well vegetated and inhabited, the population in the late nineteenth century being about 190. Katieu is a low coral atoll with a lagoon. Kawahi is a low coral lagoon covered with coconut palms and bushes (Findlay 1884). Thus the sandpiper occurs both on coral atolls, similar to Christmas Island, and on high volcanic islands.

Conclusions

The available evidence does not prove conclusively the existence of a population of *Aechmorhynchus* sandpipers on Christmas Island taxonomically distinct from that on the Tuamotus. Conversely, it does not prove that such a population could not have existed. The quality of Ellis's painting, the type of *A. cancellatus*, suggests, but does not prove, that the Christmas Island specimen was different from that of the Tuamotu population (*parvirostris*). However, in my view the evidence is sufficient to say that *parvirostris* cannot unequivocally be identified with *cancellatus*, and that therefore the latter name should not (as has recently been done)

be used for the Tuamotu population, which should revert to the name *parvirostris*. *Aechmorhynchus cancellatus* must remain a name of doubtful application, possibly but not certainly referring to an extinct species, formerly endemic to Christmas Island.

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