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AN EARLY ACCOUNT OF SOME BIRDS FROM MAUKE, COOK ISLANDS, AND THE ORIGIN OF THE "MYSTERIOUS STARLING" *Aplonis mavornata* BULLER

By STORRS L. OLSON

ABSTRACT

Overlooked manuscript notes made by Andrew Bloxam during the voyage of HMS *Blonde* detail his observations of birds on the island of Mauke, southern Cook group, on 9 August 1825, nearly 150 years before birds were again collected on the island. These notes establish that the unique type of the "Mysterious Starling" *Aplonis mavornata* Buller, a valid species previously of unknown origin and now extinct, was one of the three specimens collected on Mauke by Bloxam. The other two, which have not yet been located, if they still exist, were the kingfisher *Halcyon tuta mauke* and the fruit dove *Ptilinopus rarotongensis* cf. *goodwini*, the latter otherwise unknown on Mauke and probably now extinct there.

INTRODUCTION

Ornithologically, the Cook Islands, in south-central Polynesia, are among the most poorly known archipelagos of the Pacific. The first native land birds known certainly to have been taken in these islands were in a small collection made by Andrew Garrett on Rarotonga, probably in 1869, because the specimens were received by Godeffroy in 1870 (data from specimen labels) and described by Hartlaub & Finsch in 1871. Wigglesworth (1891a: 574) stated that Garrett "spent six months collecting in the Cook Islands of Rarotonga, Atiu, and Aitutaki," but there is no indication that he obtained birds on either of the last two, of which Atiu has an endemic subspecies of kingfisher, *Halcyon tuta atiu* (Holyoak 1974). Because Garrett was mainly a collector of marine life (Thomas 1979), he may have devoted little attention to

ornithology. There is some evidence to suggest that birds besides those reported here may have been obtained in the Cook Islands prior to Garrett, but I have not yet had the opportunity to investigate this further.

Other collections were made on Rarotonga in March 1901 (specimens taken by Lt-Colonel Gudgeon and donated by the Earl of Ranfurly to the British Museum, Natural History), 1903 (specimens collected by Alvin Seale, B. P. Bishop Museum, Honolulu), and 1904 (Wilson 1907). The Whitney South Sea Expedition (1920-1932), of the American Museum of Natural History, was denied permission to collect in the Cook Islands (E. Mayr, *in litt.*) and obtained only some seabirds from the northern Cook group (Holyoak 1980). Not until Holyoak's brief sojourn in 1973, more than a century after Garrett, were any additional species of land birds obtained in the Cook Islands (Holyoak 1974).

I report here an overlooked account of the collection and observation of birds by Andrew Bloxam on the island of Mauke, southern Cooks, during the voyage of HMS *Blonde* in 1825. These manuscript materials not only record in 1825 two species of birds that have vanished from Mauke, but also establish the provenance of the so-called "Mysterious Starling" *Aplonis mavornata* Buller, 1887, a species described from a single specimen of unknown origin in the British Museum (Natural History). Although this has long been recognised as a valid species assumed to be from some island in the Pacific, nothing else has certainly been known about it.

HMS *Blonde*, commanded by George Anson, Lord Byron, had the dismal commission of returning to their native land the bodies of the king and queen of the Hawaii, who had died of measles in England. At age 23, Andrew Bloxam, a fresh graduate from Oxford with an enthusiasm for natural history but with little instruction in the subject, was sent along as the expedition's naturalist, together with his brother Rowland, the ship's chaplain. The *Blonde* left England on 28 September 1824 and returned on 15 March 1826. It arrived in the Hawaiian Islands on 3 May 1825 by way of Madeira, Brazil, Chile, Peru, and the Galapagos. Leaving the Hawaiian Islands on 18 July, the ship made its way south, discovering and naming the island of Malden in the Line group, pausing very briefly at Mauke, and then returned home via South America and St Helena (summarised from Macrae 1922 and Bloxam 1925).

A general account of the voyage (Byron 1827) was compiled by Mrs Maria Graham, mainly from the diary of Rowland Bloxam, to which she added some natural history and other notes from Andrew Bloxam's papers. Neither of the Bloxams contributed to the production of the published volume, Rowland having been posted to Bermuda soon after his return. Mrs Graham's redactorial efforts were not well received, the general account later being called "nearly worthless" (see Macrae 1922:1), with the appendix on Hawaiian birds attributed to Andrew Bloxam being a "disgrace" that was "utterly unworthy of its reputed author" (Newton 1892:466). In 1925, the portions of Andrew Bloxam's diary pertaining to Hawaii and the Pacific were published by the B. P. Bishop Museum, the original manuscript having been obtained from Bloxam's grandson and edited by Stella M. Jones (Bloxam 1925). Both these publications contain an account of landing on Mauke and two sentences about the avifauna.

According to Bloxam's diary (1925), his party landed on Mauke, which they spelled "Mauti", on 9 August 1825, probably in the early afternoon, because Bloxam stated that they returned to the ship "about four p. m." and because, in a letter to William Swainson (Rothschild 1900:vi), he mentioned that he was on the island for only two hours. He took his gun with him "in case of meeting any curious birds" and with his party set out on a road "forming an opening through the wood", coming first to a clearing where canoes were being built and then proceeding

. . . through the woods, in which we found some trees of an immense magnitude - twenty-six or twenty-seven feet in circumference of the age I should suppose of several centuries. We next entered into a small opening where the screw pine (Pandanus) grew very abundantly and crossing this the path again struck into the wood. We had hitherto seen no indication of huts or dwellings and had already proceeded nearly a mile. I saw several beautiful birds flying about and having loaded my gun, shot one.

Thereafter they came to a park-like opening in the middle of the island, containing the main settlement. The *Blonde* had been preceded on Mauke only by missionaries, who had come from Tahiti in 1823 (Byron 1827, Bloxam 1925, Coppel 1973) and whose influence was already much in evidence. Bloxam (1925) estimated the human population of Mauke at no more than two or three hundred.

The interior of the island is open and free from trees and the whole in a state of cultivation. They were in possession of goats, pigs, fowls, etc. I saw only one dog and that apparently of the European species We saw quantities of rats with long tails, different in appearance from the common South Sea rat and resembling in color and almost in size the Norway rat. We saw them running about the wood in great quantities. I saw no lizards, but several small and beautiful butterflies. The birds found here are a brown wild duck, a species of thrush or starling, very dark brown, a beautiful kingfisher, two species of doves, the smaller kind green with the top of the head of a dark lilac color approaching to pink, a snipe, a white and blue heron and hawk. The only sea birds seen were a few tern and petrel.

The brief published mention of the birds of Mauke that appears in Byron (1827: 213) bears ample testimony to Mrs Graham's editorial deficiencies:

We saw a green dove, but could not get it: another of the same genus, extremely beautiful, which we named *Columba Byronensis*. We also saw a fine duck, a species of scolopar [*sic*]; a blue and white heron; a hawk; a king-fisher peculiar, and called by us *Alcedo Mautiensis*; a starling, and some tarn [*sic*] and petrels.

Had the editor included any of Bloxam's detailed descriptions (see below), the overlooked and unaccounted for names *Columba byronensis* Bloxam (in Byron 1827) and *Alcedo mautiensis* Bloxam (in Byron 1827) would preoccupy *Ptilinopus rarotongensis* Hartlaub & Finsch (1871) and *Halcyon*

tuta mauke Holyoak (1974) respectively. As they appear, however, these names are absolute *nomina nuda* and have no effect on subsequent nomenclature.

BLOXAM'S MANUSCRIPT NOTES

An overlooked and ornithologically much more revealing source that I have examined on microfilm is Bloxam's detailed natural history notes, along with considerable correspondence about them, mainly between Alfred Newton and Andrew Bloxam's son, A. Roby Bloxam. These materials are now filed under number M8S BLO in the British Museum (Natural History). They were examined in detail in the last century by no less an ornithologist than Alfred Newton of Magdalene College, Cambridge, and later passed through the hands of Walter Lord Rothschild and Ernst Hartert without anyone recognising the value of Bloxam's observations on Mauke (or, for that matter, of his Hawaiian notes).

There are two sets of Bloxam's notes, one rough and the other a neater transcription, which is reproduced below, followed by a discussion of the few discrepancies between the two versions. As the original largely lacks punctuation, I have supplied enough to aid comprehension.

Island of Mauti in the South Seas situated SW of Otaheite

N. 1. *Columba*. L[ength] $8\frac{3}{4}$ Inch. Bill $\frac{5}{8}$ inch. Legs red, covered with feathers nearly to the toes. Bill short, brownish. Tongue entire, sharp pointed.

Color. Forehead & top of the head a beautiful deep lilac approaching to pink. Hind head & neck all round & upper part of breast a powdered grey. Upper part of wings, tail, & back, green of various & beautiful shades & tints. The last $\frac{3}{4}$ inch of the tail a dusky pale white bar, slightly tinged with green. Wing and tail beneath pale ash. Lower part of belly and vent yellow. Upper part of belly yellowish, with a slight tinge of pink or dark lilac in the middle. Red berries were found in its maw.

Columba Byronensis.

N.2. *Sturnus*. L $7\frac{1}{2}$ inch. Color a light brownish black all over, the feathers edged round with a lighter shade of brown. Bill strong, 1 inch long. Lower m[andible] straight, upper m[andible] compressed, rather curved & slightly notched at the tip. Nostrils at the base oval. Tongue at the extremity bifid. Tail short, 12 equal [feathe]rs, rounded at the tips. Legs strong, outer toe not connected with the middle. Iris yellow.

Sturnus Mautiensis.

N.3. *Alcedo*. L. $8\frac{3}{4}$ inch. Bill $1\frac{3}{4}$ inch long, straight, pointed, nearly $\frac{3}{4}$ inch broad at the base. Upper m[andible] black, base of the lower flesh color. Nostrils oval at the base. Tongue broad, short, entire, rounded at the extremity, situated far back, $\frac{1}{4}$ inch long. Feet short, strong, outer toe connected with the middle as far as the third joint. Middle claw not serrated. Legs black. Tail feathers 12, equal, rounded at the ends.

Color. Top of the head blue surrounded with a ring of white above the eyes. Under the latter a small blue ring runs from the bill round to the back of the head, from thence on to the back is white. The upper parts of the back, wings, and tail are blue. The inner half of each quill feather brown, primary quills almost wholly so. From lower mandible to tail underneath white, as also the under wing coverts. The quill and tail [feathe]rs underneath brown.

Alcedo Mautiensis

Besides the preceding

I observed another & larger species of the dove, a brown duck similar in color & size to the common English wild duck, a species of the *Scolopax*, a white & blue heron, also a few small but beautiful insects of the papilio class, small lizards, and rats, the latter rather larger than the common S Sea rat. Few dogs, many pigs, cats, & a few goats comprised the remainder of the animals peculiar to this small island.

The rougher set of notes begins as follows:

Sea birds. White and blue heron. Hawk. A small white tern. A black tern or noddy. Frigate pelican. Widgeon or duck. A species of *Tringa* or *Scolopax*. Large green pidgeon.

This is followed by the more detailed descriptions of the *Sturnus*, *Alcedo*, and *Columba*, in that order, and a more extensive description of the duck, together with a sketch of the head. These are essentially the same as in the transcribed version, except that in the account of the "Sturnus" there is a measurement for "B[readth = wing span] 12½ inches" and the comment that it was "killed hopping about tree," which is all that we shall ever know about the behaviour of this extinct species.

A draft list of 121 specimens, mostly from South America, that Bloxam collected and presented to the Admiralty on his return includes the three birds collected on Mauke – "the number answers to the label marked on each":

No. Island of Mauti

- 30. *Columba Byronensis*
- 31. *Alcedo Mautiensis*
- 32. *Sturnus Mautiensis*

Clearly, these were the only specimens obtained on Mauke and they reached England bearing tags numbered as above.

SPECIES ACCOUNTS

We may now try to identify the birds that Bloxam saw or collected with those known today on Mauke, as listed in Holyoak (1980) and Taylor (1984).

PROCELLARIIDAE?

A "petrel" is thus mentioned only in the diary, and so the record is

equivocal. Although various petrels may be seen at sea around the Cook Islands, none were known to breed there, which is certainly an artifact of human disturbance. In caves on Mangaia, Steadman (1985) discovered abundant remains of a small species of *Pterodroma* as well as bones and a living fledgling of the *Puffinus lherminieri/assimilis* group, thus confirming petrels as breeding in the Cook Islands. Also, some form of petrel is now known to breed in small numbers on Atiu (G. McCormack, *in litt.*).

FRIGATEBIRD *Fregata* sp.

The "frigate pelican" could refer to either *F. minor* or *F. ariel*, both of which now breed in the Cook Islands only in the more remote and sparsely inhabited islands of the group, although they may wander throughout the archipelago. Although there seems to be no specific mention of frigatebirds on Mauke in the modern literature, G. McCormack (*in litt.*) informs me that a small permanent roost is there.

REEF HERON *Egretta sacra*

The "blue and white heron" can refer only to this dichromatic species, which is on all the islands of the Cook group.

GREY DUCK *Anas superciliosa*

Bloxam's description and illustration are clearly of this widespread species, which is still on Mauke.

WANDERING TATTLER *Heteroscelus incanus*

The species of "Tringa or Scolopax" is surely this, the most abundant migrant shorebird in the Cook Islands.

NODDY *Anous* sp.

Although "a black tern or noddy" could refer to *Anous stolidus* or *A. tenuirostris*, as both occur in the Cooks, the former is reported to nest on Mauke today, whereas the latter is unknown to the residents there (G. McCormack, *in litt.*).

WHITE TERN *Gygis candida*

This "small white tern" breeds at Mauke and throughout the Cook group.

ACCIPITRIDAE?

The single word "hawk" in Bloxam's rough notes and diary was curiously omitted from his transcribed notes, which, in the absence of any further description, casts great doubt on this observation. Hawks are not known in the South Pacific east of Fiji, but they may have been more widely distributed before human settlement because bones of an *Accipiter* have been found in Holocene deposits in the Hawaiian Islands (Olson & James 1982).

PACIFIC PIGEON *Ducula pacifica*

Bloxam's rather equivocal reference to a second columbid in his diary and transcribed notes is resolved in the rough notes by his mention of a "large green pidgeon", which almost certainly refers to *D. pacifica*, a species still on the island.

COOK ISLANDS FRUIT DOVE *Ptilinopus rarotongensis* cf. *goodwini*

Bloxam's wonderfully detailed and accurate description of his "Columba Byronensis" leaves no doubt that he collected *P. rarotongensis* on Mauke,

where it has not otherwise been recorded and must be assumed extinct. The species was originally described from Rarotonga, to which the nominate race is restricted, and was unknown elsewhere until Holyoak discovered a population on the island of Atiu, which he named *P. r. goodwini* (Holyoak 1974). This subspecies was distinguished from the nominate form by having the magenta patch on the belly reduced to a "few orange feather tips". (The purple crown is also darker, a character not mentioned by Holyoak.) Bloxam's description of the Mauke bird as having the belly "with a slight tinge of pink or dark lilac in the middle" accords better with *P. r. goodwini* than with the nominate race, as would be expected on geographical grounds.

CHATTERING KINGFISHER *Halcyon tuta mauke*

Bloxam's detailed description of "Alcedo Mautiensis" establishes that he collected this subspecies, which is endemic to Mauke, nearly 150 years before Holyoak (1974) collected and formally named it.

"MYSTERIOUS STARLING" *Aplonis mavornata*

This species is based on a single specimen of unknown origin that was long overlooked in the collection of mounted birds in the British Museum (Figure 1). Despite this unique specimen's uncertain source and nomenclature, it is accepted in the modern literature as representing a species distinct from any other form of *Aplonis*.

The name is attributed to Buller (1887: 25), who mentioned it as follows in an account of *Aplonis caledonicus* (= *Aplonis striata*).

The British Museum contains a good number of specimens, showing little variation, and all from New Caledonia. A specimen marked *Aplonis mavornata*, but without any reference, differs from *A. caledonicus* in having the plumage dingy brown, without any gloss, the feathers of the underparts narrowly margined with grey. This may prove to be the young of *A. caledonicus*, but no locality is given.

It is quite clear that Buller never intended to describe this specimen as a new species. Furthermore, as indicated by Sharpe (1890), the label on the stand actually said "*inornata*," and so the spelling in Buller must have been unintentional, as the specimen was *not* marked "*Aplonis mavornata*". For this reason, Sharpe (1890), followed by Wigglesworth (1891b), listed the species as *Aplonis inornata*, although that name is preoccupied in *Aplonis*, as now constituted, by *Calornis inornata* Salvadori, 1880. Greenway (1958), Amadon (1962), and others have retained the erroneous original spelling, citing Buller as the author. Although names cannot be based only on a label (Article 12c, International Code of Zoological Nomenclature, 3rd ed., 1985), which is almost the case here, Buller nevertheless did supply a description. Although the name is obviously misspelt, Buller's publication gives no internal evidence of this, as would be required to emend it. Thus, according to the present rules of nomenclature, I suppose the name *Aplonis mavornata* can stand, although the circumstances of its introduction make me most reluctant to accept it.

Sharpe (1890, 1906) and Wigglesworth (1891b) tried to equate the specimen of *Aplonis mavornata* with the drawing by Georg Forster (folio 146

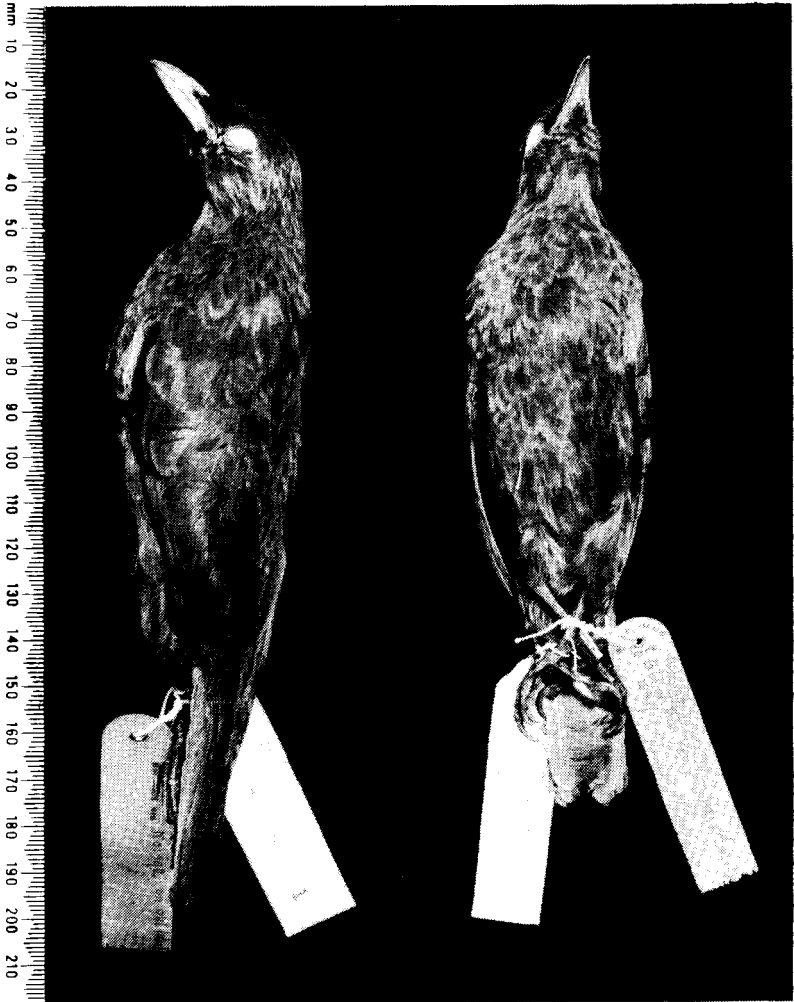


FIGURE 1 — Left lateral and ventral views of the unique holotype of the "Mysterious Starling" *Aplonis mavornata* Buller. Photographs by the British Museum (Natural History). Scale is in mm; the figure on the right is reduced 10% over that on the left.

in BM [NH], see Lysaght 1959) of a bird from Raiatea (Ulietea) in the Society Islands obtained on Cook's second voyage and called in manuscript by Forster *Turdus badius*. This became the type of *Turdus ulietensis* Gmelin. Kinnear (in Stresemann 1949: 248, footnote) pointed out the discrepancies between the specimen of *A. mavornata* and Forster's drawing and therefore considered Sharpe's claim to be unsupported. Note that a colour illustration of "*Merula*" *ulietensis* in Seebohm (1881: plate 16), stated to have been copied from Forster's illustration, is but a poor copy "since the whole aspect of the bird is changed" (Lysaght 1959: 306). The coloration in this plate also does not conform well with the original Forster drawing, which is said to depict a "reddish-brown bird with distinctly dark, almost black, wings and tail" (Kinnear, *op. cit.*). This description likewise cannot apply to *Aplonis mavornata*, nor do Forster's measurements of "*Turdus badius*" agree with that specimen, as shown by Wilesworth. Despite the fact that there was no good reason to suppose that *Turdus ulietensis* and *Aplonis mavornata* were the same, the latter has nevertheless been directly or indirectly associated with the Society Islands by various authors up to the present.

As pointed out by Kinnear (*op. cit.*), Sharpe (1880, 1906) had twice claimed that the type of *Aplonis mavornata* was the sole surviving specimen from Cook's voyages to remain in the British Museum after the collection of Joseph Banks was transferred there. The other specimens "were inadequately prepared, were always mounted, and, from a lack of appreciation of their priceless value, were allowed to decay, through want of proper curatorial knowledge" (Sharpe 1906: 79).

I have examined the unique type of *Aplonis mavornata* (British Museum, old vellum catalogue vol. 12, no. 192a). In spite of its age and having been mounted and then dismounted, it is in excellent condition and does not seem particularly faded (Figure 1). This is contrary to DuPont's (1976) speculation and to what might be inferred from Sharpe (1906: 79), who described the specimen of "*Aplonis ulietensis*", as he termed it, as having "persisted in a kind of mummified state to the present day, after having been mounted and exposed to the dust and light of the old British Museum for nearly a century." He greatly exaggerated the time it may have been thus exposed, however, because he believed wrongly that the specimen came from Cook's voyages. Its condition belies that belief, however, because the only surviving Banksian specimen would not be likely to be in such fine shape, given Sharpe's comments about the fate of the rest of the specimens. On the other hand, many of Bloxam's specimens are still in good to excellent condition. I was able to locate in the British Museum (Natural History) all but one of the 25 specimens he brought back from the Hawaiian Islands. Unfortunately, in a survey of the appropriate parts of the skin collection, I could not find Bloxam's specimen of *Ptilinopus*, nor that of *Halcyon*, from Mauke.

The specimen of *Aplonis mavornata* corresponds exactly with Bloxam's description of his "*Sturnus Mautiensis*," which was "light brownish black all over, the feathers edged round with a light shade of brown." The adjective "light" applies if seen as a modifier of "black," the overall appearance of the bird being quite dark. This colour is relieved only by the narrow lighter-brown margins of the feathers, as mentioned by Bloxam, the plumage having

little or no gloss or iridescence, unlike most species of *Aplonis*. As presently made up, with the head bent upwards somewhat, the skin measures nearly $7\frac{1}{4}$ inches in length and when fresh would therefore have been very near the $7\frac{1}{2}$ inches given by Bloxam. His measurement of the bill in the Mauke starling was 1 inch. This must have been taken from the rictus, as his measurement of $1\frac{3}{4}$ inches for the bill of the Mauke kingfisher is exactly that from the rictus to the tip in the one paratype of *Halcyon tuta mauke* in the British Museum (Natural History). The same measurement in the type of *Aplonis mavornata* is just short of 1 inch (0.94), the discrepancy being easily accounted for by shrinkage. For comparison in future studies, the following measurements of the type of *Aplonis mavornata* may prove useful: wing 105 mm, tail 64.0, culmen from anterior margin of nostril 12.4, length of mandibular symphysis 11.7, tarsus 27.4.

Bloxam's description and the type of *Aplonis mavornata* are alike in all details; the specimen is in good condition and in the British Museum (Natural History) where Bloxam's material was deposited; only one specimen of the species is known; and no one collected birds on Mauke for almost 150 years after Bloxam, ample time for the species to become extinct. Thus, it is almost inconceivable that the type of *Aplonis mavornata* is anything other than the starling collected by Bloxam. Therefore, rather than having no data whatever, one can now say with some confidence that the specimen was shot hopping about in a tree before 4.00 p.m. on the afternoon of 9 August 1825 by Andrew Bloxam on the island of Mauke in the southern Cook group, which is about as precise as one could hope to be after 160 years.

The presence of *Aplonis mavornata* on Mauke is of further interest in that a very different species, *Aplonis cinerascens*, occurs on Rarotonga. The latter could not possibly be the bird described by Bloxam because *A. cinerascens* is larger (length $8\frac{1}{2}$ inches) and is decidedly grey, with light grey margins to the feathers and a whitish belly and undertail coverts. It will be interesting to see what paleontology reveals of the former distribution of *Aplonis* in the Cook Islands. Were there different species on each island, for example, or could two such different species as *A. cinerascens* and *A. mavornata* have coexisted sympatrically on some islands?

CONCLUSIONS

The evidence for man-caused extinctions of organisms on islands in the Pacific continues to accumulate at a fast rate. Much of this evidence, which has come mainly from analyses of bones from paleontological and archeological sites, shows dramatically just how severely depleted the avifaunas of Polynesia really are – for example, in the Hawaiian Islands (Olson & James 1982), Henderson Island (Steadman & Olson 1985), and New Zealand (Cassels 1984). In the Cook Islands, Steadman (1985) has documented from fossils found in caves on Mangaia the disappearance of a petrel (*Pterodroma*), a storm petrel (*Nesofregetta*), two species of flightless rails (*Porzana*, *Gallirallus*), three columbids (*Gallicolumba*, *Ducula*, *Ptilinopus*), and a parrot (*Vini*), probably since the arrival of Polynesians.

Particularly in areas as poorly explored as the Cook Islands, it may be impossible to determine the exact timing of such extinctions, their exact

causes, or whether the extinctions are attributable to the influence of Polynesians, Europeans, or both. The precious data supplied by Bloxam and the voyage of the *Blonde* indicate with certainty that at least two species of birds, *Ptilinopus rarotongensis* and *Aplonis mavornata*, have become extinct on Mauke since 1825. To these may possibly be added a petrel and a hawk.

The cause of the extinction of these birds remains uncertain, but Bloxam's own observation of "quantities" of rats, which he perceived to be similar to Norway rats (*Rattus norvegicus*), is of considerable interest. Atkinson (1985) has suggested that the Norway rat became the common shipboard rat between 1710 and 1830 and thus reached most Pacific islands from Europe before *Rattus rattus* did. Bloxam's visit to Mauke, coming only two years after the first European contact with that island, shows the evident rapidity with which populations of these rats may increase, provided Bloxam was correct that the rats he saw were not *R. exulans*.

We can safely assume that other, as yet unknown, species of birds inhabited Mauke before the coming of man, many of which would have disappeared well before the arrival of the *Blonde*. Flightless rails, doves of the genus *Gallinucula*, and parrots are three likely possibilities. Paleontological investigations on Mauke would doubtless aid in revealing the kind and number of these species.

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STORRS L. OLSON, *Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D. C. 20560, USA*

SHORT NOTE

Unusual waterfowl behaviour

On 6 July 1986 I visited the Matata Lagoons, arriving about 10.30 a.m. The weather was cold and wet with a south-westerly wind blowing. On scanning the lagoon opposite the Matata Hotel I saw two dense, round groups of birds, about 70 m apart, well out in the open water. Each group, about 15 m in diameter, was composed of c.100 ducks of two species – New Zealand Shoveler (*Anas rhynchosotis*) c.65% and New Zealand Scaup (*Aythya novaeseelandiae*) c.35%. In general, the shoveler formed the dense centre of each group, swimming in circles and surface feeding, while the scaup formed the perimeter, diving about, and under, the group. The sexes of both species appeared to be equally well represented. There were numerous other members of both species scattered around the lagoon but none of them seemed to take any interest in the two dense groups, which seemed to be involved in a feeding frenzy.

When I left Matata at 11 a.m. both groups were still in much the same position and still actively feeding. I returned briefly at about 2 p.m. to find the groups still present and active, though their positions had altered a little.

P. C. M. LATHAM, *c/o Papamoa Beach P.O., via Te Puke, Bay of Plenty*