

Tracking Cook's third voyage (1776–79) Hawaiian Rails *Porzana sandwichensis*, with some comments on their type status

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SUMMARY.—Hawaiian Rail *Porzana sandwichensis* is an extinct species of crane from the Hawaiian archipelago that was endemic to the island of Hawaii. The provenance of the two types in Leiden and Vienna is shrouded in mystery, as their early history is incomplete and both changed hands before reaching their current destinations. Furthermore, one or both specimens were originally described as *Rallus obscurus*, a synonym of *Porzana sandwichensis*. The known history of both specimens is reviewed, and the results of recent research are collated in order to critically review some persistent uncertainties as to their provenance.

The first account of Hawaiian Rail *Porzana sandwichensis* appears in Cook & King (1784) the official account of Captain James Cook's third circumnavigation of the globe. The Hawaiian Islands were discovered during this voyage, which visited Kauai in January 1778 and Hawaii on 17 January–4 February 1779, returning on 11 February to make repairs, before departing again on 23 February (during which time Cook was killed, on 14 February) (Stresemann 1950, Medway 1979, 1981). Cook's two ships anchored at Kealahou Bay in Kona district, where specimens of 11 bird species were collected, including at least two of Hawaiian Rail, although the precise number has never been determined (Stresemann 1950, Medway 1981).

A section describing the avifauna of Hawaii in the manuscript journal of Charles Clerke (captain of the *Discovery*) was quoted in Cook & King (1784). In it, Clerke described 'a Rail with short wings and no tail, which on that account we named, *Rallus ecaudatus*.' William Ellis, the expedition's surgeon, also depicted the rail in a painting now in the Natural History Museum (NHM), London (Folio 70) (Medway 1979, Knox & Walters 1994).

Upon the expedition's return to England, two specimens of the rail were acquired by Joseph Banks and are recorded in two catalogues of his collection compiled by Jonas Dryander. In one, the Solander Catalogue (Medway 1979), the rails comprise entry no. 110; in the other (comprising four lists), they are entry no. 125, list 3 (Medway 1979, 1981). In the latter, Dryander referred to them as *Rallus obscurus* (Medway 1981). Latham, in his *General synopsis of birds* (1785), recorded seeing specimens in the Banks collection and the Leverian Museum: apparently not realising they were the same species, he described the Banks specimen as 'Sandwich Rail' (pt. 1, p. 236) and the Leverian specimen as 'Dusky Rail' (pt. 1, p. 237). The Leverian specimen's origin is unknown, but could have been one of Banks' specimens that he had donated to the Leverian Museum. J. F. Gmelin (1789) subsequently described *Rallus sandwichensis* (p. 717) and *Rallus obscurus* (p. 718) based on Latham's 'Sandwich Rail' and 'Dusky Rail,' respectively.

In van den Hoek Ostende *et al.* (1997) the type (RMNH 87450) of *Rallus sandwichensis* J. F. Gmelin, 1789, is listed as being held at the Naturalis Biodiversity Center, Leiden, the Netherlands (hereafter Naturalis) (Fig. 1), while Schifter *et al.* (2007) listed the type (NMW 50.728) of *Rallus obscurus* J. F. Gmelin, 1789, as being in the Naturhistorisches Museum Wien (NMW) (Fig. 2). Here we summarise the known history of both specimens.



Figure 1. Specimen of Hawaii Rail *Rallus sandwichensis*, Naturalis Biodiversity Centre (NCB), Leiden (Justin J. F. J. Jansen / © NCB)

History 1789–1821

The Banks specimens.—In 1792, Banks divided his collection of zoological specimens between the British Museum and John Hunter's collection (Whitehead 1978, Medway 1981). Hunter's collection was purchased in 1799 for the Company of Surgeons, which became the Royal College of Surgeons in 1800 (Cope 1959, Medway 1981). In 1809, the college purchased a large number of specimens from the British Museum, many of them reportedly part of the 1792 Banks donation. In 1813 William Bullock received some birds in an exchange of specimens with the college. Most, if not all, were apparently part of the 1792 Banks donation to the British Museum (Medway 1981). Bullock auctioned his museum in 1819 and several of Banks' specimens were sold. Although Sharpe (1906) suggested the Bullock Museum as the origin of the Naturalis rail, no rail from the Hawaiian Islands was apparently exhibited in the Bullock Museum (Bullock 1809, 1811, 1812, 1813).

In 1845, the Royal College of Surgeons donated 348 natural history specimens, including 135 birds, to the British Museum (Medway 1981). At least 72 of the birds can be identified as those Banks donated to Hunter in 1792. Unfortunately, only two are known to survive, an Iiwi *Vestiaria coccinea* from Hawaii and Saddleback *Philesturnus carunculatus* from New Zealand (Medway 1981). Neither the RMNH nor NMW rails can be identified in these transactions.

Leverian Museum auction.—In 1806 the contents of the Leverian Museum were auctioned and an unknown number of specimens from Cook's voyages were sold. However, there is no mention of the 'Dusky Rail' that Latham saw in the Leverian Museum in the auction catalogue (King & Locheé 1979).



Figure 2. Specimen of Hawaii Rail *Rallus sandwichensis*, Naturhistorisches Museum Wien (NMW) (Justin J. F. J. Jansen / © NMW)

Bullock Museum auction.—According to the auction catalogue of the Bullock Museum (Anon. 1819), Lot 68, sold on the 17th day of the sale (27 May 1819), comprised a ‘Pair of Dusky Rails’, and Lot 68*, sold the same day, was a ‘Dusky Rail, *R. Obscurus*, and another; from New Zealand’ (Anon. 1819). Lord Ledbrooke purchased Lot 68 (Anon. 1819—in the Balfour & Newton Libraries, Cambridge, UK: Johnson & Hewett 1979), who was bidding for Richard Grenville, first Duke of Buckingham and Chandos (Lee 1903). The whereabouts of these birds are unknown.

Four complete copies of the Bullock auction catalogue survive, in NHM (two), in Cambridge, UK, and at Naturalis. A fifth catalogue is also known, but only from a facsimile reprinted in 1979; the original’s current location is unknown. Except for one of the NHM catalogues, all were annotated by their owners with the names of buyers next to the lots they purchased. Although the persons responsible for the annotations in the second NHM catalogue and the 1979 reprint are unknown, the Cambridge catalogue was reportedly annotated by John Latham (Newton 1891), while the Naturalis catalogue, which belonged to Coenraad Jacob Temminck, is annotated in Temminck’s own hand.

According to Sharpe (1906, citing the Cambridge catalogue), Johnson & Hewett (1979), and the NHM annotated catalogue, Lot 68* was purchased by Temminck, and Temminck’s own notes in the Naturalis catalogue also indicate that he purchased Lot 68*. However there is no reference of this in *Achats Oiseaux et Mammifères / Nota van aankopen mammalien en vogelen in de publieke veiling van de heer Bullock in London*, a seven-page list in the Naturalis

archives, undated but also in Temminck's hand, of the specimens he purchased at the auction. Its absence from the 'Nota' does not necessarily prove that Temminck did not purchase Lot 68*, as the 'Nota' only lists nine purchases made on 27 May, while the annotated NHM catalogue and Temminck's catalogue indicate that he bought 22 lots (the Cambridge catalogue indicates fewer purchases). The difference in the number of purchases recorded in the 'Nota' and copies of the auction catalogue is a mystery that cannot presently be explained.

On the 21st day of the sale (3 June 1819), Temminck purchased Lot 37 (Fig. 3). According to the catalogue this comprised a 'Rail, undescribed; from the voyage of Captain Cook.' Although Medway (1981) believed this is the Hawaiian Rail now at Naturalis, Temminck's 'Nota' identifies Lot 37 as *Rallus longirostris*, indicating that it was actually a Clapper Rail, which is native to North and South America. However, Cook only visited one area within the latter's range, a stopover at Rio de Janeiro, Brazil, on his first voyage in November 1768. Interestingly, Lot 66, sold on 27 May (the same day as the two pairs of 'Dusky Rails') also involved a 'Long-billed Rail, *R. Longirostris*'. But, according to the annotated NHM and Cambridge catalogues, Lord Stanley bought it; Temminck's copy does not suggest that he was the purchaser.

103	<i>Buteo calurus</i>	8
105	<i>Amberiza myzomera</i>	3
127	12 various species of birds	9
June 3.		
2	<i>Tetra senegalensis</i>	1
30	<i>Phalaropus spinosus</i>	3
33	<i>Numenius islandicus</i>	1
37	<i>Rallus longirostris</i>	6
40	<i>Phalaropus nigricollis</i>	6
48	<i>Procellaria carolinensis</i> & <i>pelagicus</i>	4
June 4.		
113	a fine continentally bred of <i>apirica</i>	16

Figure 3: Part of Temminck's memo held in the archives at the Naturalis Biodiversity Centre (NCB), Leiden, describing the specimens accessioned on 3 June 1819 (Justin J. F. J. Jansen / © NCB)

Discussion

The missing years: 1785–1821.—After Dryander compiled the Solander Catalogue, listing the zoological specimens in the Banks collection procured during Cook's third voyage, shortly after its return (Medway 1979), and Latham's mention of specimens of the rail in the Banks and Leverian collections, the specimens do not surface until 1821 at Naturalis. In the intervening period, they are not definitively identified anywhere, including the above-mentioned Bullock auction catalogues, nor were they in Temminck's private collection in 1807 (Temminck 1807).

Temminck at the Bullock auction.—Although it is generally believed that Temminck bid at the Bullock auction on his own behalf (Stresemann 1951), the lack of any documentation concerning his private collection in the Naturalis archives, and the existence of the 'Nota,' indicate that his purchases were made for another source, probably Leiden University. The 'Nota' is undated, but the handwriting indicates it was written c.1820 (some additions to the memo were made with a different pencil but are from the same period). In April 1819 H. Kuhl and M. H. C. Lichtenstein travelled with Temminck to London for the auction, and to study birds and mammals in the Bullock Museum and in other collections prior to the sale (Klaver 2007). The memo contains scientific names for most species, both generic and specific.

Formation of Naturalis.—Of the three collections that were merged when Naturalis was founded, only a single list (Naturalis archives) exists for one, 's Land Kabinet of Natuurlijke Historie (144 species and 200 specimens of birds), the government cabinet founded during the brief reign of King Louis Napoleon (Holthuis 1995, Farber 1997); the rails do not feature. The size and species composition of the others, Temminck's private

collection and the Leiden University collection (Holthuis 1995), on 9 August 1820 (when *Naturalis* was founded), are unknown. Thereafter only a 'book of presents' was kept until August 1881, when all specimens entering the collection were recorded.

1821 exchange.—Two specimens of the rail were at *Naturalis* in early 1821, but were separated on 27 February 1821, when Temminck, the museum's first director, included one in an exchange of specimens with NMW (73 items arrived in May 1821). Temminck's goal for the new museum was to make it the most complete collection, and he was satisfied with just one specimen of each species, or a male and female of sexually dimorphic species. Duplicates were exchanged to acquire species not yet in the Leiden collection (Gijzen 1938). As Temminck obviously would never have exchanged unique specimens in the Leiden collection, the specimen sent to NMW must have been a duplicate.

It is unclear if the two rails came from Temminck's private collection or from Leiden University. The role Temminck's private collection played in the formation of the *Naturalis* is unknown. According to Holthuis (1999) Temminck's collection came to *Naturalis* in 1830 but much of it remained packed until at least 1838. However, Temminck stated in his first annual report for *Naturalis* on 1 August 1821 that he exchanged specimens from his private collection with the local merchant Reindert Draak and others collected by Caspar Georg Carl Reinwardt in Indonesia. Temminck also mentioned a third collection in the same report, possibly purchases made at the Bullock auction.

Regarding the *Naturalis* rail, Finsch (1898) stated that there is no record of where and when Temminck acquired it. The same is true for *Prosobonia leucoptera*, Tahiti (or White-winged) Sandpiper, known only from a single specimen collected by Forster in 1773 during Cook's second voyage, which also reached *Naturalis* via an unknown route (Fuller 1999).

Cook specimens.—Finsch (1898) doubted that any of Cook's specimens had survived and quoted Alfred Newton: 'Cook's specimens were not skins but dried examples and have long since perished.' However, Newton was incorrect, as several specimens from Cook's voyages survive (Stresemann 1951, Steinheimer 2005). The NMW specimen retains its skull, as well as wing and leg bones, as do other Cook specimens. Furthermore, probably both rails were skins, not dried specimens, when they arrived in the Netherlands. The NWM specimen is a study skin but that at *Naturalis* is mounted. According to Finsch (1898), the latter was re-mounted by the museum's taxidermist, and it has artificial glass eyes with red irides and wire mounts frequently used by Leiden taxidermists at this period.

Extant data on NMW 50.728.—In the list of specimens written in Temminck's hand, sent to NMW on 27 February 1821, the rail is listed as '*Gallinula obscura* Nov. Holl.' (Fig. 4). Its label (Fig. 2), prepared by J. Natterer, was added after the specimen arrived at NMW.

Temminck's use of 'Nov. Holl.' is puzzling. He wrote mostly in French and 'Nouvelle Hollande' ('New Holland' = Australia) was used for many years at *Naturalis*. Given that Temminck identified the NMW bird as Latham's 'Dusky Rail' (described by Latham as *Rallus obscurus* in 1790, as Gmelin had done the year before) and that Latham (in 1785) noted that it 'Inhabits the Sandwich Islands,' Temminck's ascribing it to 'Nov. Holl.' on the NMW list is incomprehensible, as he was aware that the bird was not from Australia. A possible, but perhaps unlikely,

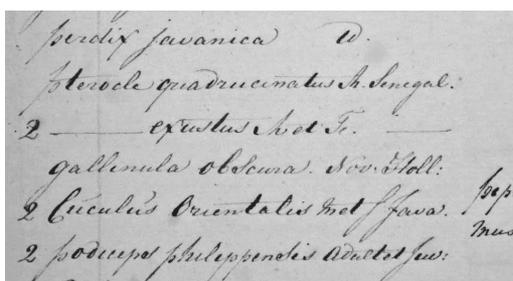


Figure 4. List of specimens sent to Naturhistorisches Museum Wien on 27 February 1821 by C. J. Temminck, from the archives at the *Naturalis* Biodiversity Centre (NCB), Leiden (Justin J. F. J. Jansen / © NCB)

explanation is that it refers to 'The New Holland Division' in Shaw's 1806 catalog of the Hunter Museum. As discussed above, Banks donated part of his collection to John Hunter in 1792, and Shaw referred to the contents of that donation in his catalogue as 'The New Holland Division' (Medway 1981). Was Temminck indicating that the NMW bird was part of that donation?

RMNH 87450.—When H. Schlegel (director of Naturalis following Temminck's death in 1858) began work on his inventory of Naturalis specimens (1862–81), there was at least some original information associated with most of them (Jansen in prep.). These data were subsequently transcribed by Schlegel and F. H. O. Finsch (curator in 1897–1904) onto new labels, during which process many mistakes were made (Jansen in prep.). After transcribing them, Schlegel and Finsch discarded the original labels and they were lost. Hence, of those specimens known to have been purchased at the Bullock auction, no information is recorded in Temminck's hand; what is available was added later by Schlegel and Finsch.

Under the base on which the Naturalis bird is mounted Temminck wrote: '*Gallinula obscura*, *Rallus* – Lath, Sandwich' ('Sandwich' was added later, in a different hand). Schlegel added: '*Crex sandwichensis*, Cat. N: 1, Cook' (Fig. 5). It is probable that '*Rallus* – Lath' was Temminck's shorthand for, '*Rallus* according to Latham,' as Temminck assigned it to *Gallinula*. Schlegel not only assigned it to a different genus again, but changed the species name from *obscurus* to *sandwichensis*, which has priority. In his *Ralli* and *Scolopaces*, pt. V (1864–65), he noted under *Crex sandwichensis* 'adulte, iles Sandwich, voyage de Cook'; he probably added the information on the specimen's base at the same time.

The bases of the Tahiti Sandpiper and Hawaiian Rail at Naturalis are very distinct from those of other small birds in the museum from the same period in having two thin wooden crosspieces nailed to the underside, which clearly link the two specimens. However, as larger birds (penguins and other seabirds) have apparently identical bases yet date from the 1870s, it is difficult to date those of the sandpiper and rail.

How many birds?—As mentioned, Dryander listed two specimens of Hawaiian Rail in Banks' private collection prior to 1782 (Medway 1979) and Latham saw two specimens (described under different names) in the Leverian Museum. However, four 'Dusky Rails' were sold at the Bullock auction on 27 May 1819 in Lots 68 and 68*. If these four specimens were Hawaiian Rails, then it is unclear how many were collected during Cook's third voyage. An analogous case is that of Tahiti Sandpiper. Dryander listed just one specimen in the Banks collection (Medway 1979), but Latham saw at least three specimens from Tahiti and Moorea (where the closely related *Prosobonia ellisi* occurred) (Latham 1781–85). Only one specimen of *P. leucoptera* survives today, in Naturalis, while *P. ellisi* is known only from two paintings, by Ellis and Webber (both of whom accompanied Cook on his third voyage), at NHM, as is a painting of *P. leucoptera* by Forster. Although two pairs of 'Dusky Rails' comprised Lots 68 and 68* at the Bullock auction, for some reason those in Lot 68 were stated to be from New Zealand in the auction catalogue, indicating that they may have been



Figure 5. The base of the mounted Hawaii Rail *Rallus sandwichensis*, Naturalis Biodiversity Centre (NCB), Leiden (Justin J. F. J. Jansen / © NCB)

Spotless Crakes *Porzana tabuensis*, rather than Hawaiian Rails. If they were Hawaiian Rails, the (anonymous) author of the catalogue was wrong.

Paler vs. darker birds.—Both rails were collected in Kona district and have paler dorsal coloration emphasising the darker centres to the feathers than the five other extant specimens (Olson 1999), all of which were collected in the mid-19th century in Puna district. Although it was formerly conjectured (Greenway 1967, Ripley 1977, Taylor 1998) that the paler Kona specimens represented immatures, Olson (1999) proposed that the differences represent geographic variation, and that Kona and Puna birds are different subspecies. The nominate Kona race was presumably paler because it inhabited the drier leeward side of Hawaii, while Puna *P. s. millsii* inhabited the wetter windward side. This accords with Gloger's Rule, which states that within species of endotherms, darker forms occur in more humid environments.

Possible sources.—The rails could have reached Naturalis from sources other than the Bullock auction. Firstly, S. J. Brugmans, director of the natural history collection at Leiden University, had direct contact with Banks in 1791 (Dawson 1958). As Banks sent Brugmans the remains of a native Australian man (www.lumc.nl/rep/0000/att/80813053317221/90928025452222.pdf: accessed 27 September 2012), it is probable that Banks donated other specimens to Brugmans as well.

Either Brugmans or Temminck could have received specimens from Bullock via exchanges. Bullock exchanged specimens with other museums, such as Paris in 1814.

No fewer than 93 ships visited the Hawaii archipelago in 1786–1819 (www.hawaiian-roots.com/shipsB1880.htm: accessed 5 August 2012). It is unknown how many stopped at the island of Hawaii, or whether any bird specimens were collected there.

J. G. A. Forster and A. von Humboldt visited the Netherlands in April 1790 and met Temminck (Raaf 1976). Forster is a possible source, as he and his son, Georg, were naturalists on Cook's second voyage, and Georg procured specimens of Iwi *Vestiaria coccinea* from a third-voyage crew member upon which he based its description in 1780 (Medway 1981).

Specimens could have been secured via the route described by Whitehead (1979); however, some collections are not described therein. Three examples from the Netherlands are worth noting. At the auction of the collection of W. S. Boers on 14 August 1797 (van Cleef & Schreurleer 1797), no fewer than two birds ('*Certhia rubra*' and '*Muscicapa taitensis*') from 'Otaheite' (= Tahiti?) and three Australian parrots were sold, indicating a relationship between Boers and Banks. The L. F. Holthuisen collection, which included seven specimens of four species of Hawaiian birds—Ou *Psittirostra psittacea*, Iwi, Apapane *Himatione sanguinea* and Hawaii Amakihi *Chlorodrepanis virens* (Meise 1950)—and probably three from Tahiti—Blue-crowned Lorikeet *Vini australis*, Blue Lorikeet *V. peruviana* and Pacific Imperial Pigeon *Ducula pacifica*—originating from Cook's third voyage (Meise & Stresemann 1950), was auctioned in October 1793 (Lichtenstein 1793). A Hawaii Mamo *Drepanis pacifica* held in the 's Lands Kabinet of Natuurlijke Historie, one of the founding collections of Naturalis, was noted in an inventory prepared by Temminck in 1814 (Naturalis archives).

Exchanges made directly with either Ashton Lever or the Royal College of Surgeons can not be eliminated. Although no documentation exists, the rails could also have been obtained via direct exchange with the Paris museum, which has some specimens that clearly came from Banks (e.g., Yellow-tufted Honeyeater *Lichenostomus melanops*).

Conclusion

Since being separated on 21 February 1821 by C. J. Temminck, the history of the Leiden and Vienna rails has been filled with assumptions (Finch 1898, Medway 1981, Olson 1994).

The evidence of Sharpe (1906), that the specimens arrived at Naturalis via Temminck, who acquired them at the Bullock auction, was the most accurate then available.

In his catalogue of the Banks collection, Dryander listed two specimens of the Hawaiian Rail under *Rallus obscurus* (Medway 1979). Latham (1785) described the 'Sandwich Rail' from at least one of these, and Gmelin (1789) based his *R. sandwichensis* on Latham. Latham (1785) also described a bird seen by him in the Leverian Museum as the 'Dusky Rail.' That Latham used Dryander's Anglicised name indicates that it may have been one of Banks' two specimens that had been donated to Lever. Gmelin (1789) described it as *Rallus obscurus*, again based on Latham. Copies of the Bullock auction catalogue reveal that two pairs of 'Dusky Rails' were sold on 27 May 1819. If these were all Hawaiian Rails, then four specimens may have reached England, and therefore it is unknown how many specimens were actually collected on Cook's third voyage. Nor can it be determined which, if any, of the 'Dusky Rails' at the Bullock auction, if they were Hawaiian Rails, were the specimens described by Latham.

Furthermore, it is uncertain whether Temminck purchased the Lot 68* 'Dusky Rails' at the Bullock auction. Although copies of the auction catalogue, including his own, indicate that he did, the 'Nota' at Naturalis, in his own hand, suggests otherwise. As outlined, various other, equally legitimate possibilities could explain how two Hawaiian Rails reached Naturalis in February 1821 without Temminck's involvement. The inevitable conclusion is that their provenance is unclear.

Due to the lack of proper documentation and hence our inability to definitively link either of Latham's original descriptions to a specific specimen, the Naturalis and NMW specimens should henceforth be regarded as syntypes of *Rallus sandwichensis* and *R. obscurus*, and thus also syntypes of *Porzana sandwichensis* (ICZN 1999).

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