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The authenticity of 'Iwi *Drepanis coccinea* (G. Forster, 1781) skins from Cook's third voyage: what taxidermy can add to the discussion

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SUMMARY.—The 'Iwi *Drepanis coccinea* was discovered during James Cook's third circumnavigation (1776–80) and described by G. Forster in 1781. Several possibly authentic specimens and data sources linked to the original expedition exist. However, investigations into preparation style of the various 'Iwi specimens in question identified five different workshops and thus provenances. Only one specimen (at Göttingen, Germany) can unequivocally be considered authentic Cook material.

The first mention of the 'Iwi *Drepanis coccinea* (G. Forster, 1781) was made during the third circumnavigation of the globe captained by James Cook (1728–79). Cook & King (1784 pt. II: 207–208) stated: 'local collectors supplied them with often bundles up to twenty or more 'Iwi's [...] (21 January 1779)'. However, it was specified that the natives removed the contents of the heads and dried the specimens. The next note on these birds was in Cook & King (1784 pt. II: 227), with a remark dated from February 1779 that the species was never seen alive, presumably because of its absence from coastal regions (Pratt 2017). The first painting is from Waimea, Kauai, Hawaii, made in January–February 1778 by John Webber (Rijksmuseum, Amsterdam). Georg Forster described the species on 16 December 1780 (Forster 1781) as *Certhia coccinea*, but publication was in early 1781.

The ornithological exploits from Cook's voyages have been the subject of ongoing scientific debate, e.g. Merrem (1784), Sharpe (1906), Gyldenstolpe (1926), Lönnberg (1926), Stresemann (1949, 1950), Lysaght (1959), Burton (1969), Whitehead (1969, 1971, 1978), Sweet (1970), Medway (1976, 1979, 1981, 2002, 2004, 2009), Wagstaffe (1978), Elter (1986), Largen (1987), Hauser-Schäublin & Krüger (1998), Bauernfeind (2003, 2004) and Steinheimer (2003a,b, 2005, 2006a,b). In general, there is disagreement concerning preparation style and the number of skin specimens that have survived from Cook's expeditions.

For this paper, we examined all known 'Iwi specimens collected prior to 1826. This paper aims to link certain taxidermy traits to different workshops to achieve a better understanding of what constitutes authentic Cook material.

Material and Methods

We personally examined the following specimens: RMNH.AVES.148551 (Fig. 1), NHMUK 1845.2.21.295 (Fig. 12), NHMUK A.1845.2.21.297 (spirit specimen; Fig. 5), NHMUK 1845.2.21.297 (Fig. 12), NHMUK 1845.2.21.368, NHMUK 1845.2.21.387, SMNH A 533670, SMNH A 533669 (Fig. 6), GAU 345 (Fig. 10) and NMS_Z 1926.21.95 (Fig. 14). Additionally we received data pertaining to the following specimens: LivCM D511a, LivCM D511b (Fig. 3), MRSN 2240 and MRSN 2241 (Fig. 8). Accompanying material was consulted in the libraries, archives and collections of MfN, NMS and MNHN (museum acronyms follow Roselaar 2003 except NMHUK = BMNH; GAU = Ethnographic Collection of the Georg



Figure 1. Adult 'Iwi *Drepanis coccinea*, Naturalis Biodiversity Center, Leiden (RMNH.AVES.148551) (Justin J. F. J. Jansen, © NBC)



Figure 2. Adult 'Iwi *Drepanis coccinea*, Naturalis Biodiversity Center, Leiden (RMNH.AVES.148551) (© NBC)

August University Göttingen, see also Acknowledgements). Most specimens were X-rayed ($n = 10$) or physically examined ($n = 2$). For comparative purposes, another 104 X-rays of bird skins from the late 18th and early 19th centuries have been studied.

Known expeditions to Hawaii pre-1825

HMS Resolution and *HMS Discovery*.—James Cook's third circumnavigation of the globe (1776–80) with the *HMS Resolution* and *Discovery* spent several periods at the archipelago of Hawaii, on 18–23 January 1778 and 1–8 March 1779 (Kauai), 29 January–1 February 1778 (Niihau) and 17 January–23 February 1779 (Hawai'i) (Stresemann 1950, Medway 1981, Olson 1989, Olson & James 1994, Steinheimer 2006a). Those persons known to have possessed bird specimens from the third expedition are: William Wade Ellis (1751–85), Charles Clerke



Figure 3. Juvenile male 'Iwi *Drepanis coccinea* (upper bird) (LivCM D511b) and adult male (lower) (LivCM D511a), National Museums Liverpool (Tony Parker, © World Museum, Liverpool)

(1741–79)¹, Thomas Davies, Barthold Lohmann (1749–1812), David Nelson (d. 1789), David Samwell (1751–98), Heinrich Zimmermann (1741–1805) and probably several unnamed shipmen (Plitschke 1931, Stresemann 1950, Whitehead 1978, Medway 1981). Zimmermann (1781) and Samwell (1957, 1967) described three extended land excursions at Kealakekua Bay, on the island of Hawai'i between 24 and 30 January 1779 (cf. Steinheimer 2006b). No original notes are attached to any of the known / supposed / suspected specimens. Subsequently, George Humphrey, Georg Forster and a certain Mr Dalmer (Merrem 1784) had seen or possessed 'Iwis by 1783.

HMS Astrolabe.—Louis Dufresne visited Hawaii briefly with the ill-fated *Astrolabe* voyage (1785–87); however, it is notable that no Hawaiian Honeyeaters are mentioned in Dufresne's 1815 (archives at MfN) and 1818 catalogues (archives at NMS).

HMS Queen Charlotte and *HMS King George*.—The *HMS Queen Charlotte* and *King George* first visited Hawaii in 1786 (Beresford & Dixon 1789), calling at Oahu in 1786 and 1787, and collected a few birds (Dixon 1789: 111–112, Munro 1944, Banko & Banko 1981: 196, Frohawk *et al.* 1989: 60). It is unknown if any avian specimens have survived.

Private vessel *Venus*.—During his visit to the Hawaiian Islands, George Bass (1771–1803) documented spells on Hawai'i, Oahu, Kauai and Molokai (dates from original correspondence ZML MSS 6544 Mitchell Library, Sydney, Bowden 1980: 86–87, Estensen 2005: 151–154). He is a known bird collector (Jansen 2014, Jansen & van der Vliet 2015), and a few of his birds are still housed at MNHN, but none from Hawaii has been discovered.

¹ Clerke did not survive the voyage and his bird specimens came into the possession of an unknown crew member.



Figure 4 (left). 'Iwi *Drepanis coccinea*, National Museums Liverpool (right LivCM D511a and left LivCM D511b) (Tony Parker, © World Museum, Liverpool)

Figure 5 (right). 'Iwi *Drepanis coccinea*, Natural History Museum, Tring (NMHUK A.1845.2.21.297) (© Natural History Museum, London)

HMS Blonde.—Anchored at Hilo, Hawai'i (3 May 1825 and 7 July 1825), Lahaina, Maui (4 May 1825) and Honolulu, Oahu (6 May–7 June and 9–18 July 1825: Olson 1996). The expedition's main collector was Andrew Bloxham. His few surviving specimens are at what are now NHMUK and NMS (Olson & James 1994, Olson 1996).

Distribution of the specimens

Twelve 'Iwi specimens from the first four decades following the species' discovery have been traced. Additional specimens have been mentioned in literature and some of them may belong to the 12 discussed here.

The largest number of specimens ended up in Joseph Banks' collection in London. Banks (1743–1820) was the naturalist on Cook's first voyage. Jonas Dryander compiled a handwritten catalogue of Joseph Banks' avian collection (see Medway 1979: 316) listing



Figure 6. Adult male 'Iiwis *Drepanis coccinea*, Swedish Museum of Natural History, Stockholm (SMNH A533669, A533670) (Justin J. F. J. Jansen, © SMNH)



Figure 7. Adult male 'Iiwis *Drepanis coccinea*, Swedish Museum of Natural History, Stockholm, Sweden (SMNH A533669, A533670) (© SMNH)

among others a *Certhia rubra* (list 3 / 4: no. 51). According to Medway (1979: 323, lot 35) 12 'Iwi specimens were once present in Banks' collection. In 1792, Banks' birds were divided



Figure 8. Juvenile male 'Iwi *Drepanis coccinea* (left) (MRSN 2241) and adult male (right) (MRSN 2240), Museo Regionale di Scienze Naturali di Torino, Turin (Giovanni Soldato, © MRSN)

between the British Museum and John Hunter (Medway 1981: 122). From the latter just one 'Iwi arrived, via the Royal College of Surgeons, at NHMUK (Burton 1969). Others might have been acquisitioned by William Bullock in 1813. Bullock's collection was auctioned in 1819 (Anon. 1819). Two 'Iwis listed in the auction catalogue (Medway 1981: 124) were acquired by Franco Andrea Bonelli and subsequently ended up in the Turin museum.

'Iwis were also noted in other private collections. That held by Willem Sebastiaan Boers (1752–1811) was (eventually) purchased by a Mr Voigt on 14 August 1797 (Cleef & Schreurleer 1797)². Another 'Iwi—noted on 14 October 1793 in a shop owned by the Leverian and British Museum's taxidermist John Thompson (d. 1811)—is not recorded as being in present in any collection today (Medway 1981: 138). 'Iwis in the museum of Sir Aston Lever (1729–88) were described in 1782 by John Latham (1782: 704). Sarah Stone (1760–1844) (Bernice Pauahi Bishop Museum, Honolulu, Hawaii, vol. 3: no. 20: Jackson 1998: 124) depicted one of these birds. The museum apparently held two males and two females or younger birds. Lever's collection went by lottery to the estate agent James Parkinson (c.1730–1813) on 23 March 1786 and was auctioned in June 1806. Lot 2790, a male and a female, were sold to John Latham, Lot 3070, containing a single bird, was acquired by an unknown purchaser and Lot 4750, comprising two specimens, purchased by Thompson on behalf of Lord Stanley, later 13th Earl of Derby (1775–1851) (Thompson's annotation cat. NHMUK Donovan *et al.* 1806³, Stanley's annotation reprint King & Locheé 1979a)—both are still in Liverpool. Two 'Iwis (NMW 1806.I.535 and 535a) are no longer present at Naturhistorisches Museum, Vienna (H.-M. Berg *in litt.* 2016), although they were recorded in the first inventory of 1806. The origin of those specimens is unknown. Lot 103, sold on 27 May 1819 during the Bullock auction, was acquired by a collector named Mr Fector (King & Locheé 1979b). Georg Forster, in describing the species, had just one specimen (that belonging to Lohmann) of the species (Forster 1781: 346), but he knew of three other

² He could have received the specimen from Robert Jacob Gordon at the Cape when the Cook expedition docked there in April/May 1780 on the return journey—Dutch merchants had an outpost there.

³ Registered at NHMUK London as NHMUK 2RB 85AS.L.

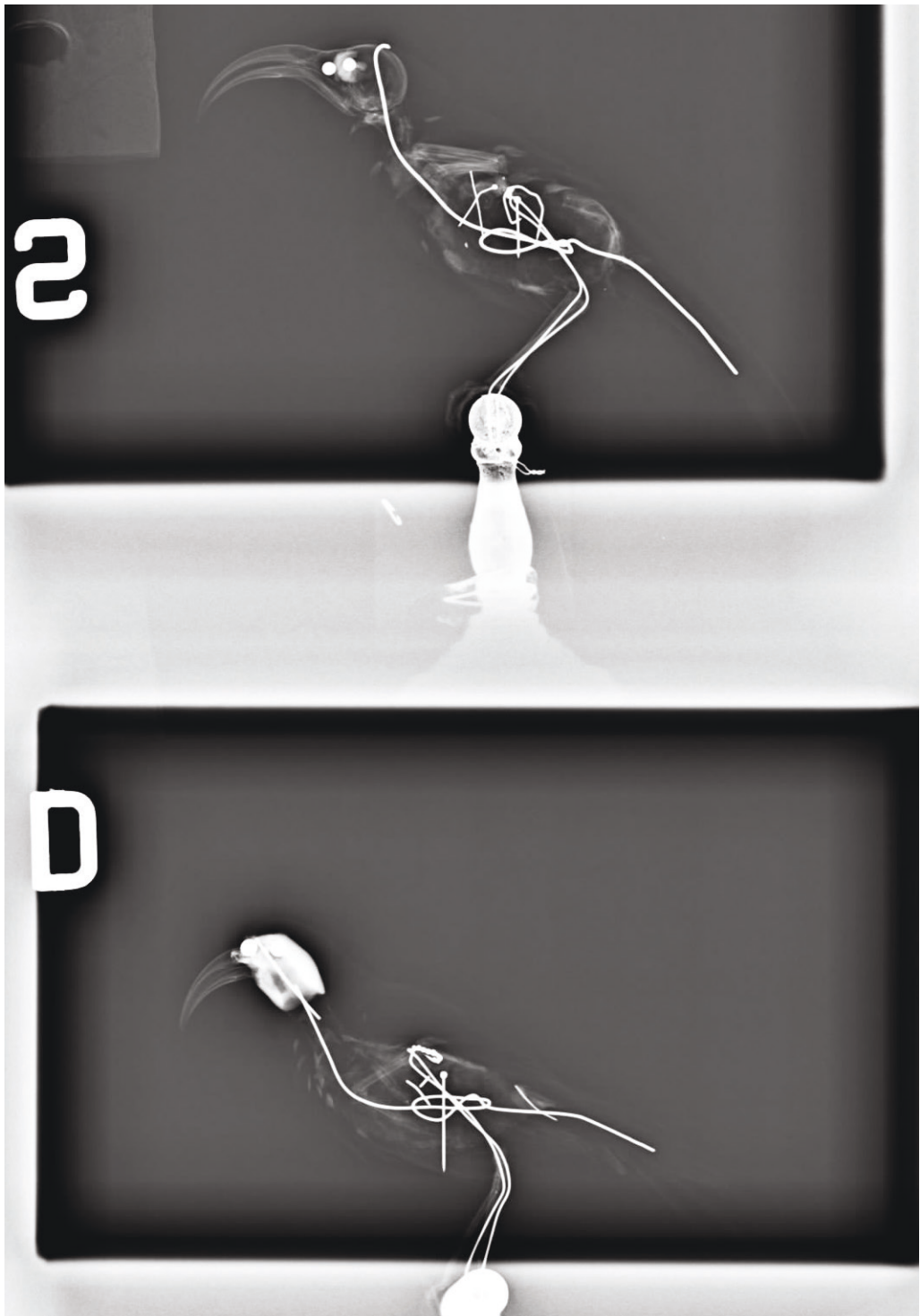


Figure 9. 'Yiwi *Drepanis coccinea*, Museo Regionale di Scienze Naturali di Torino, Turin (above, MRSN 2241; below, MRSN 2240) (Giovanni Soldato, © MRSN)



Figure 10. Adult 'Iwi *Drepanis coccinea*, Ethnographic Collection of the Georg-August-Universität Göttingen (GAU 345) (Justin J. F. J. Jansen, © Göttingen)

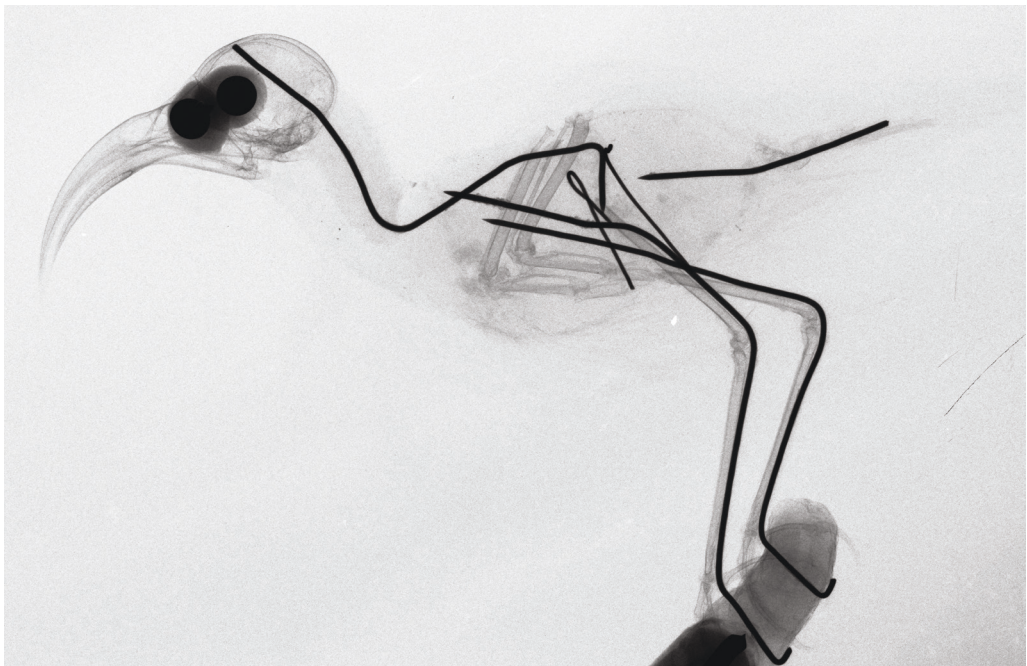


Figure 11. Adult 'Iwi *Drepanis coccinea*, Ethnographic Collection of the Georg-August-Universität Göttingen (GAU 345) (Gert Tröster, © Göttingen)

specimens (Forster 1781: 347) (*contra* Merrem 1784: 9, Medway 1981: 118). He may have learned of their existence from correspondence with Joseph Banks, but we have not looked



Figure 12. Adult male 'Iiwis *Drepanis coccinea*, Natural History Museum, Tring (NMHUK 1845.2.21.295 and 1845.2.21.297) (Alex Bos, © Natural History Museum, London)

deeper into the Banks archive. The type specimen was studied at Kassel, Germany, and most likely it was one of the two 'Iiwis still held by the local natural history museum in the late 1930s. In an undated three-volume MS list (prepared at the end of the 1930s) one can find amongst the 2,413 birds, under no. 1405 two 'Iiwis (one from Verein für Naturkunde zu Kassel). The same catalogue also included two Hawaiian Apapane *Himatione sanguinea* registered as no. 1406 (two 'first-year females' from the Verein für Naturkunde zu Kassel) and a Bristle-thighed Curlew *Numenius tahitiensis* as no. 1070 (unregistered archive material, Naturkundemuseum in Ottoneum Kassel). However, the sources and origin of these specimens as well as their acquisition date/s remain unknown, although a third-voyage origin is more than likely. The entire collection was destroyed on the night of 22/23 October 1943 in a WWII raid (P. Mansfeld *in litt.* 2015). The fate and origin of the three other known specimens, retrospectively seen by Forster, are unknown.

Results

Workshops.—No fewer than five different workshops (identified by the method of wiring, the make of the artificial body and the treatment of the original bird) were responsible for the mounting of the pre-1826 'Iwi specimens that have been studied by X-radiation for this paper. On the X-rays the use of arsenic soap / powder is not conclusive, but three birds appear to show dust on the outside of the body (NHMUK 1845.2.21.297, LivCM D511a, D511b); however, further tests are needed.

MRSN 2240 and 2241 (Fig. 9): these originate from the same workshop as for example another 'Iwi (RMNH.

TABLE 1
Data and notes on preparation of twelve *Tiwi Drepanis coccinea* (G. Forster, 1781) specimens with an origin pre-1826 which are found in collection worldwide. For acronyms see Methods / Acknowledgments.

Acronym	Specimen No.	provenience	X-ray	skull opened	remaining post-cranial bones	wiring	workshop/school
RMNH	AVES.148551	Coenraad Jacob Temminck, ex. coll. Bullock / Hullett or earlier	yes	partly destroyed	wing bones, broken tibiotarsus, few caudal vertebrae	hooked / bent wires, twisted with each other, soft body	1
MRSN	2240	Franco Andrea Bonelli, ex coll. Bullock	yes	not opened	wing bones, no visible tibiotarsus, neck & caudal vertebrae, parts of pelvic girdle	hooked / bent wires, twisted with each other, soft body	1
MRSN	2241	Franco Andrea Bonelli, ex coll. Bullock	yes	partly destroyed	wing bones, no visible tibiotarsus, few caudal vertebrae, parts of pelvic girdle	hooked / bent wires, twisted with each other, soft body	1
SMNH	A 533669	Gustaf von Paykull, ex coll. ?von Carlson, Grill, Lever	yes	opened	broken tibiotarsus, wing bones not visible (close to modern skin)	2 leg wires, 1 neck wire, pinned, hard body	2
SMNH	A 533670	Gustaf von Paykull, ex coll. ?von Carlson, Grill, Lever	yes	opened	wing bones, broken tibiotarsus, caudal vertebrae, parts of pelvic girdle	1 thick wire and additional pins, rather soft body	3
NHMUK	1845.2.21.297	Lord Byron, ex coll. ?HMS <i>Blonde</i>	yes	opened	wing bones, leg bones (subsequently) broken	1 thick wire and additional pins, rather soft body	3
GAU	345	Johann Friedrich Blumenbach, ex coll. Humphrey, ?Samwell	yes	not opened	wing bones, broken tibiotarsus, caudal vertebrae	several pins & sharp wires (including tail wire), hard body	4
NHMUK	1845.2.21.295	Royal College of Surgeons, ex coll. ?HMS <i>Discovery / Resolution, Astrolabe, Queen Charlotte, King George</i>	yes	not opened	wing bones, broken tibiotarsus, caudal vertebrae	single wires each for neck, legs, tail, wings, banded, loosely connected, soft body	5 (similar to 1)
LivCM	D511a	Lord Stanley, ex. coll. Lever	yes	not opened	wing bones, (subsequently?) broken tibiotarsus, parts of pelvic girdle	1 wire (not in legs), ?wires subsequently removed	no workshop assignment
LivCM	D511b	Lord Stanley, ex. coll. Lever	yes	not opened	wing bones, (subsequently?) broken tibiotarsus, parts of pelvic girdle	2 wires (1 in leg), ?wires subsequently removed	no workshop assignment
NHMUK	A.1845.2.21.297	Royal College of Surgeons, ex coll. ?Cook, HMS <i>Astrolabe, Queen Charlotte, King George</i>	no	not opened	complete skeleton	[spirit specimen]	no workshop assignment
NHMUK	1845.2.21.368 // 387	Lord Byron, ex coll. HMS <i>Blonde</i>	no	unknown	unknown	not investigated	no workshop assignment
NMS	Z 1926.21.95	ex coll. ?HMS <i>Blonde</i>	no	unknown	unknown	not investigated	no workshop assignment

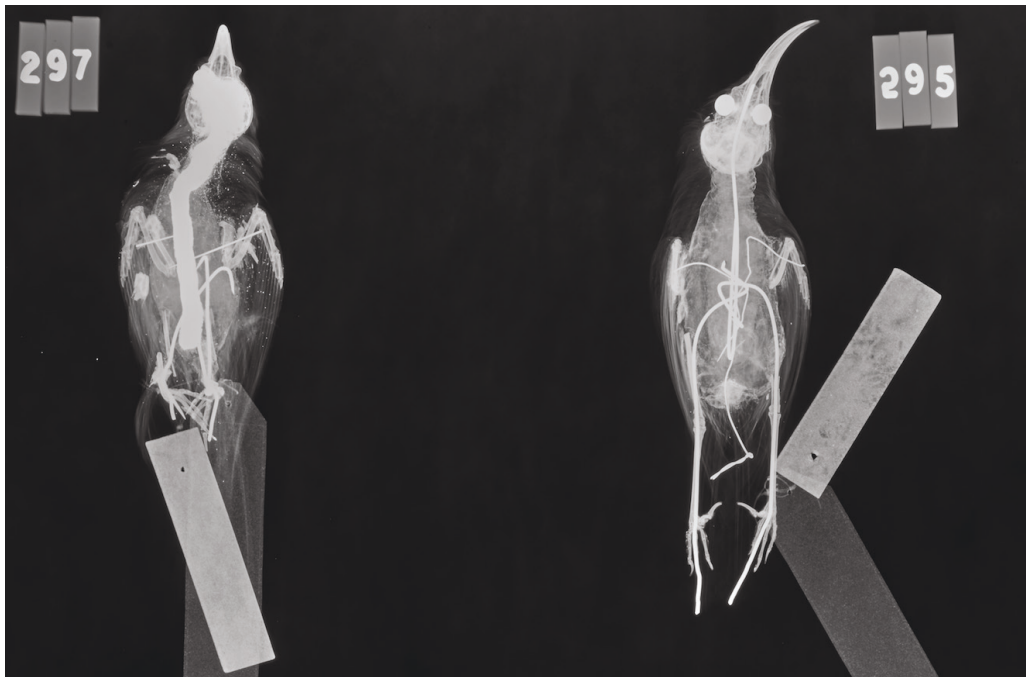


Figure 13. Adult male 'Tiwi *Drepanis coccinea*, Natural History Museum, Tring (NMHUK 1845.2.21.295 and 1845.2.21.297) (© Natural History Museum, London)

AVES.148551), an Apapane *Himatione sanguinea* (RMNH.AVES.148558) and a Kaka *Nestor meridionalis* (NHMUK 1837.6.10.379).

SMNH A533669 (Fig. 7): similar to birds from the workshop that also worked on specimens collected by Anders Sparrman during the second Cook voyage, i.e. a White Tern *Gygis alba* (SMNH A569927), Blue Lorikeet *Vini peruviana* (SMNH A569914), Red-crowned Parakeet *Cyanoramphus novaezelandiae* (SMNH A569923), Tui *Prothemadera novaeseelandiae* (SMNH A533743), Piopio *Turnagra capensis* (SMNH A568806), Cape Cormorant *Phalacrocorax capensis* (SMNH A558970), Tahiti Flycatcher *Pomarea nigra* (SMNH A569917) and Tahiti Reed Warbler *Acrocephalus caffer* (SMNH A569913).

SMNH A533670 (Fig. 7): this specimen has a thick wire inside. Other specimens possibly from the same workshop are another 'Tiwi (NHMUK 1845.2.21.297), a Marbled Murrelet *Brachyramphus marmoratus* (NMW 53422), a Moorea Kingfisher *Todiramphus youngi* (NMW 50633), a Raiatea Parakeet *Cyanoramphus ulietanus* (NMW 50687) and a Tahiti Reed Warbler (NMW 58499).

GAU 345 (Fig. 11): similar to a stuffed Hawaii Oo *Moho nobilis* (Hanover Museum) of the same origin, but wires slightly less bent.

NHMUK 1845.2.21.295 (Fig. 13): prepared with single wires each for the neck, legs, tail and wings, which are loosely connected and bent within a soft body. Another bird from the same workshop is perhaps a Blue Lorikeet (NHMUK 1845.2.21.329). The make of their mounts is very similar or nearly identical to the specimens of workshop 1, but the wires are more loosely connected.

Discussion

It can be noted that preparation in the field determines whether certain skeletal and muscle parts remain in the specimens. Bent wires can be used only when bodies of the skins



Figure 14. Adult 'Iwi *Drepanis coccinea*, National Museums Scotland, Edinburgh (NMS 1926.21.95) (Bob McGowan, © NMS)

remained soft; hard bodies (e. g. mummies, dried muscles) require pinned wires (Morris 2012). One can identify two schools during the voyages of James Cook, those crew members trained or influenced by Joseph Banks during the first voyage and subsequently by Banks or workshops that Banks recommended in London, and those taught their taxidermy skills by J. R. Forster and / or Anders Sparrman during the second voyage. The third voyage had no official trained naturalist on board so one can assume that all taxidermy skills of crew members were gathered beforehand. No literature or archival material confirms any training of crew members before leaving British shores, but it is known that Banks (who, e.g., had a plant collector on board the third voyage) and Forster had significantly influenced crew members to collect specimens.

Forster (1771) preferred a rather quick preparation method of partly mummifying specimens and simultaneously using heavy poison (arsenic soap or dust) to control insect pests, rather than preparing them completely (preferred by Banks who probably was unaware of the use of arsenic soap at the time). Forster had a big influence on the taxidermy skills of crew members. He might have directly or indirectly trained or advised crew members to use dried native skins for mounting museum specimens. This method was much quicker and easier than re-working native dried specimens to modern mounts without part-mummification.

Wiring probably occurred in Britain before disposal of specimens to collections abroad, but always after leaving the vessels. One can assume that mounting occurred in different workshops in Britain and Sweden.

Another obstacle to a systematic review is that native Polynesians of the Hawaiian archipelago were also skillfully preserving bird specimens, as feathers and dried birds played a large part in their culture. Native bird skins probably were partially prepared, leaving vertebrae and long bones as well as an unopened skull in the skin. Therefore, especially during visits by Europeans to Hawaii, already skinned and dried specimens were acquired rather than fresh dead birds. The different 'schools' subsequently used probably the ready skins without altering the bone composition so that the workshops' typical bone assemblages most probably would not be diagnostic in early Hawaiian skins. Once the specimens arrived home, wires were anchored in the dried bodies probably after some relaxation by humidity, and the belly cavities filled with any dry and soft material. Furthermore, pinned eyes were mainly used (little black balls on wire), as the alternative, fragile concave glass lenses, were better placed during the skinning process. Arsenic soap, if already known, could be applied only in the lower body cavity or externally.

One of the workshops was run by John Thompson who received the official expedition material and was therefore responsible for most bird specimens in the Leverian and British Museums (*fl.* 1785–1811; British Museum archives PPA331622, PPA331624, Anon. 1811), another workshop by George Humphrey, who acquired specimens directly from crew members, including the Göttingen 'Tiwi. This Göttingen specimen is the only one with continuous documentation back to 1782 and thus is the only proven Cook specimen. Taking the close similarity of preparation in account, one can assume that both Turin specimens (MRSN 2240, 2241), one Leiden specimen (RMNH.AVES.148551) and to a lesser extent one of the Tring specimens (NHMUK 1845.2.21.295) may possess the same origin. However, according to associated label data, the latter specimen is apparently from the *HMS Blonde* expedition, while the Leiden and Turin specimens had been viewed as Cook specimens (Whitehead 1969, 1978). Since it is rather unlikely that any crew member served on both voyages 36 years apart and even work traditions active for several decades would be exceptional, incorrect data association might be the more plausible scenario, although it is impossible to be conclusive about this for now.

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