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The ambiguous identity of *Turdus mustelinus* Wilson, and a neotype designation for the Veery *Catharus fuscescens* (Stephens)

by Matthew R. Halley

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SUMMARY.—The long-recognised name of the Veery *Catharus fuscescens* (Stephens 1817) was intended to replace Tawny Thrush *Turdus mustelinus* Wilson, 1812, which was preoccupied by *T. mustelinus* J. F. Gmelin, 1789. Herein, I demonstrate that *T. mustelinus* Wilson is unidentifiable because it was based on attributes shared by more than one species, including some features that are a better match to other *Catharus* species than to Veery. None of the specimens mentioned in Wilson's description is extant. To maintain traditional nomenclature and to prevent destabilising confusion arising from alternative identifications, I designate a neotype for *Turdus mustelinus* Wilson and its replacement names, including *T. fuscescens* Stephens, fixing the name to the taxon to which it has been traditionally applied. The neotype is a colour-banded male that was tracked over two consecutive years with light-level geolocator and GPS tracking units. To my knowledge, it is the first bird specimen in any collection for which migratory data were collected with either device.

The taxonomic history of the forest-dwelling thrushes of eastern North America (*Catharus*) ranks among the most obscure and confusing chapters of American ornithology. Repeatedly, multiple names were unknowingly applied to a single species, or conversely, attributes of multiple species were combined to form a composite species (Coues 1878). Today, in addition to Wood Thrush *Hylocichla mustelina*, which has sometimes been placed in *Catharus*, ornithologists recognise nine taxa of five species that breed in and / or migrate through the Mid-Atlantic region of eastern North America: *C. guttatus faxoni* (Bangs & T. E. Penard, 1921), *C. g. crymophilus* (Burleigh & J. L. Peters 1948), Hermit Thrush; *C. ustulatus swainsoni* (J. Cabanis in Tschudi, 1845), *C. u. clarescens* (Burleigh & J. L. Peters 1948), Swainson's Thrush; *C. fuscescens fuscescens* (Stephens 1817), *C. f. fuliginosus* (Howe, 1900), Veery; *C. minimus minimus* (Lafresnaye, 1848), *C. m. aliciae* (S. F. Baird, 1858), Grey-cheeked Thrush; *C. bicknelli* (Ridgway, 1882), Bicknell's Thrush.

However, when Alexander Wilson (1766–1813) first became acquainted with William Bartram (1739–1823) in winter 1803, they distinguished only two members of the complex in eastern North America: (1) a relatively larger species called Wood Thrush or Wood Robin *Turdus melodus* (Wilson 1808), now known as Wood Thrush *Hylocichla mustelina* (Gmelin 1789: 817), and (2) a relatively smaller, composite species called Little Thrush *Turdus minor* (Gmelin 1789: 809). However, Bartram, who in his time had a more advanced knowledge of birds than any other American (Allen 1951), was not yet convinced that *T. melodus* and *T. minor* were different species. It was Wilson, in 1807, who first convinced him that they were different by comparing fresh specimens to Edwards' (1760) plate, which depicted a specimen collected in 1756 by Bartram himself (Wilson 1808: 33–34):

'But Mr. Edwards has also described and delineated the Little Thrush, and has referred to Catesby as having drawn and engraved it before. Now this Thrush of Edwards I know to be really a different species [than the Wood Thrush]; one not resident in Pennsylvania, but passing to the north in May, and returning the same way in October, and may be distinguished from the true Song Thrush (*Turdus Melodus*) [i.e., Wilson's (1808) name for the Wood Thrush, adapted from Bartram's (1791) *T. melodes*] by the spots being much broader, brown, and not descending below the breast. It is also an inch shorter, with the cheeks of a bright tawny color. Mr. William Bartram, who transmitted this bird, more than 50 years ago, to Mr. Edwards, by whom it was drawn and engraved, examined the two species in my presence; and on comparing them with the one in Edwards, was satisfied that the bird there figured and described is not the Wood Thrush (*Turdus Melodus*), but the tawny cheeked species above mentioned. This species I have never seen in Pennsylvania but in spring and fall. It is still more solitary than the former, and utters, at rare times, a single cry, similar to that of a chicken which has lost its mother. This very bird I found numerous in the Myrtle swamps of Carolina in the depth of winter, and I have not a doubt of its being the same which is described by Edwards and Catesby¹... A figure and description of this passenger Thrush will appear in an early part of the present work.'

The objectives of the present paper are to (1) explain how and when *T. minor* J. F. Gmelin became a taxonomic composite; (2) demonstrate that the material and descriptive basis of *T. mustelinus* Wilson was insufficient to distinguish the species now known as Veery (*C. fuscescens*) from the composite *T. minor* (i.e. Wilson's Tawny Thrush was also an amalgamation); (3) show that Charles Lucien Bonaparte (1803–57) and John James Audubon (1785–1851), who had opportunities to see Wilson's type material, also failed to distinguish Veery from the composite *T. minor*; and (4) resolve and stabilise the nomenclature of Veery by designating a neotype that restricts the name *fuscescens* Stephens, 1817, to those of its breeding populations in eastern North America which have traditionally borne this name.

Taxonomic amalgamation in *Turdus minor*

To evaluate Wilson's (1808: 33–34) comments, it is first necessary to understand how *T. minor* J. F. Gmelin became taxonomically composite. According to references in Gmelin's original description, the story traces back to the very beginnings of American ornithology, to the English naturalist Mark Catesby (1683–1749), who described the Little Thrush in 1731 and gave it the pre-Linnaean name '*Turdus minimus*' (Fig. 1). This was the first and only small spotted thrush known from North America before 1756, when Bartram, aged 17 years, collected a specimen of another small thrush near his family home (Bartram's Garden) near Philadelphia, Pennsylvania (Trotter 1907). Bartram included that specimen in a shipment to London, to the English naturalist George Edwards (1694–1773), who subsequently illustrated and described it in the second volume of *Gleanings of natural history* (1760; Fig. 2). Edwards presumed that Bartram's specimen was synonymous with Catesby's (1731) Little Thrush.

The identity of the Little Thrush that Catesby had encountered in 1722–24 on the coastal plain of South Carolina and Georgia is questionable. An examination of Catesby's plate reveals a thoroughly ambiguous species (Fig. 1), probably because it was illustrated from memory, without reference to a specimen; Little Thrush was not included in specimen

¹ This remark was absent from Wilson's original (1808) description, but was added to the 300 additional copies of Vol. 1 that were printed in 1809, after Wilson returned to Philadelphia from the south-eastern USA (see Faxon 1901).



Figure 1. Cropped image of Little Thrush from Pl. 31 of Catesby (1731), probably illustrated without reference to a specimen (see text). Image reproduced courtesy of the Library of the Academy of Natural Sciences of Drexel University (QH41.C35).



Figure 2. Cropped image of Little Thrush from Pl. 296 of Edwards (1760), depicting the specimen collected in 1756 by William Bartram (see text). A medallion in the illustration bears the initials 'GE' (George Edwards) and the year 1757, indicating that the image was drawn from a fresh specimen, not more than one year old. Image reproduced courtesy of the Library of the Academy of Natural Sciences of Drexel University (QL674.E261).

lists sent by Catesby to Hans Sloane in May 1723 and March 1724 (see Nelson 2017). Nevertheless, his descriptive text provides useful clues to its identity:

'In shape and colour it agrees with the Description of the European Mavis, or Song-Thrush, differing only in Bigness; this weighing no more than one Ounce and a quarter. It never sings, having only a single Note, like the Winter-Note of our Mavis. It abides all the Year in Carolina. They are seldom seen, being but few, and those abiding only in dark Recesses of the thickest Woods and Swamps. Their Food is the Berries of Holly, Haws, &c.' (Catesby 1731, pl. 31)

Although some authors have suggested that Catesby's Little Thrush was a Wood Thrush, or a Grey-cheeked Thrush, or simply unidentifiable (e.g., Feduccia 1985, Stanton 2013), there is no *Catharus* with a breeding distribution that includes coastal South Carolina and Georgia, and only one species that occurs there in winter: eastern Hermit Thrush *C. guttatus faxonii*. Wood Thrush *H. mustelina* occurs on the Atlantic coastal plain of South Carolina during the breeding season, but the weight provided by Catesby for his Little

Thrush ('no more than one Ounce and a quarter' [i.e. < 35 g]) is too light for that species, which weighs on average 45.2 g with fat, and 38.8 g without ($n = 35$; Yong & Moore 1993). The weight recorded by Catesby, however, is just right for a Hermit Thrush that has been gorging on berries, as Catesby (1731) described ('Their Food is the Berries of Holly, Haws, &c.'). Furthermore, Hermit Thrushes primarily communicate with calls during winter (i.e. song is uncommon), matching Catesby's observation that 'It never sings, having only a single Note.' This last point is also inconsistent with Wood Thrush, which uses multiple 'notes' on its breeding grounds. Catesby's assertion that the bird 'abides all the year' in Carolina was probably a reflection of his ignorance of its migration, as later explained by Bartram (1791: 284, 300–301).

However, Edwards' (1760) pl. 296 and text description of Bartram's specimen do not match Hermit Thrush, but rather, either Veery *C. fuscescens* or Grey-cheeked Thrush *C. minimus*: 'The head, upper side of the neck, back, wings, and tail, are all of a reddish-brown or clay colour, not at all varying in the shades of the feathers, as they do in our English thrushes.' Therefore, Edwards' (1760) Little Thrush is a composite: the first artistic depiction of a Veery or Grey-cheeked Thrush, accompanied by information from Catesby (1731) about wintering Hermit Thrushes, and field notes from Bartram that could have applied to any of these species. Thereafter, Brisson (1760: 212) and Forster (1771: 11) copied Catesby's description without any additional knowledge.

A further source used by Gmelin (1789) in his circumscription of *T. minor* came via Pennant (1785: 338) from the English naturalist Joseph Banks (1743–1820), who collected a small thrush on his expedition in 1766 to Newfoundland and Labrador. The specimen that Pennant (1785: 338) referred to Catesby's (1731) Little Thrush is no longer extant, but his inclusion of the detail 'eyelids encircled with white' led Lysaght (1971: 383) to identify it as *Catharus ustulatus clarescens*. However, this identification is far from conclusive because the other *Catharus* species from Newfoundland also have a pale eye-ring, albeit fainter.

Therefore, when Little Thrush was given the Linnaean binomial *Turdus minor* by Gmelin (1789: 809), it was apparently a grand amalgamation of the taxa now known as *C. g. faxoni* (in Catesby 1731), *C. u. clarescens* (in Pennant 1785, via Banks), and either *C. f. fuscescens* or *C. m. minimus* (in Edwards 1760, via Bartram). Without any extant original material to typify the name, *Turdus minor* J. F. Gmelin is effectively unidentifiable and a *nomen dubium* under the Code (ICZN 1999). Fortunately, it is not in use.

The material basis of *Catharus fuscescens* (Stephens 1817)

Wilson (1812) took the unprecedented step of recognising not one small spotted species of thrush in North America, but two. One was Hermit Thrush *T. solitarius*, an amalgamation based on Edwards' composite Little Thrush (i.e. Hermit Thrush, plus either Veery or Grey-cheeked Thrush) and attributes of Swainson's Thrush *C. u. swainsoni* (see Brewer 1844). The other was the Tawny Thrush *T. mustelinus*, which Wilson considered new to science. Wilson did not specify a holotype for *T. mustelinus*, but he cited the number of a specimen in the Peale Museum (5570) and more casually referred to many other specimens, any of which could be considered part of the type series. When the Peale Museum closed in 1846, a portion of the collection was sold to the showman and circus promoter P. T. Barnum (1810–91), and was presumably displayed on the third floor of Barnum's American Museum in New York City. Shortly after midnight on 13 July 1865, a fire broke out in the bird department and the entire building including its ornithological contents were destroyed (Anon. 1865).

The rest of the Peale Museum collection was sold to Moses Kimball (1809–95) of the Boston Museum in 1850, then passed to the Boston Society of Natural History (Faxon 1915). Some of the specimens were thereafter destroyed, and others sold to Charles J. Maynard

(1845–1929), who stored them in his barn in Newtonville, Massachusetts. The specimens were subsequently transferred again, and finally accessioned in the collection at Harvard University, Cambridge, MA, where they are stored today. However, what remained of the original Peale Museum labels was lost during the process. All that now survives of Wilson's types are some specimens without original labels (no specimens of Veery or Grey-cheeked Thrush are among them) and some secondary (Boston Museum) labels unattached to specimens. Among the loose labels are two that read 'Wilson's Thrush. *Turdus fuscescens* Shaw' (= Stephens), a replacement name for *T. mustelinus* that was not restored to this species until decades after Wilson's death. These secondary labels now constitute the only physical evidence that the types of Wilson's Tawny Thrush existed (Faxon 1915). Thus, without any extant specimen from the type series, we must depend solely on Wilson's (1812: 98) descriptive text and illustration to identify his *T. mustelinus*:

'This species makes its appearance in Pennsylvania from the south regularly about the beginning of May, stays with us a week or two, and passes on to the north and to the high mountainous districts to breed. It has no song, but a sharp chuck. About the twentieth of May I met with numbers of them in the Great Pine swamp, near Pocano; and on the twenty-fifth of September, in the same year, I shot several of them in the neighbourhood of Mr. Bartram's place. I have examined many of these birds in spring, and also on their return in Fall, and found very little difference among them between the male and female. In some specimens the wing coverts were brownish yellow; these appeared to be young birds. I have no doubt but they breed in the northern high districts of the United States; but I have not yet been able to discover their nests.'

'The Tawny Thrush is ten inches long, and twelve inches in extent; the whole upper parts are a uniform tawny brown; the lower parts white; sides of the breast and under the wings slightly tinged with ash; chin white; throat and upper parts of the breast cream colored, and marked with pointed spots of brown; lores pale ash, or bluish white; cheeks dusky brown; tail nearly even at the end, the shafts of all, as well as those of the wing quills, continued a little beyond their webs; bill black above and at the point, below at the base flesh colored; corners of the mouth yellow; eye large and dark, surrounded with a white ring; legs long, slender and pale brown.'

'Tho I have given this bird the same name that Mr. Pennant has applied to one of our Thrushes, it must not be considered as the same; the bird which he has denominated the *Tawny Thrush* being evidently from its size, markings, &c. the *Wood Thrush*, described in the first volume of the present book.'

'No description of the bird here figured, has, to my knowledge, appeared in any former publication.'

Wilson's comment that 'the whole upper parts are a uniform tawny brown; the lower parts white,' has been taken by most authors as sufficient evidence that the species was a Veery (e.g., Coues 1878, Burt & Davis 2013). However, that description applies just as well to some Grey-cheeked thrushes from Newfoundland and Labrador (*C. m. minimus*), which are also a uniform tawny-brown over the upperparts (Fig. 3; see also Wallace 1939, Marshall 2000, FitzGerald *et al.* 2017). 'Brown phase' individuals of *C. minimus* were unknown to Coues (1878: 27), who wrote of Veery, 'it appears to have been first adequately described by Alexander Wilson, in 1812...'. There is considerable variation in colour among extant first edition copies of the plates of *American ornithology*, where Wilson first published *T. mustelinus*, partly because of poor paper quality, and partly because the hand-coloured plates in different copies have been subject to different environmental conditions over time

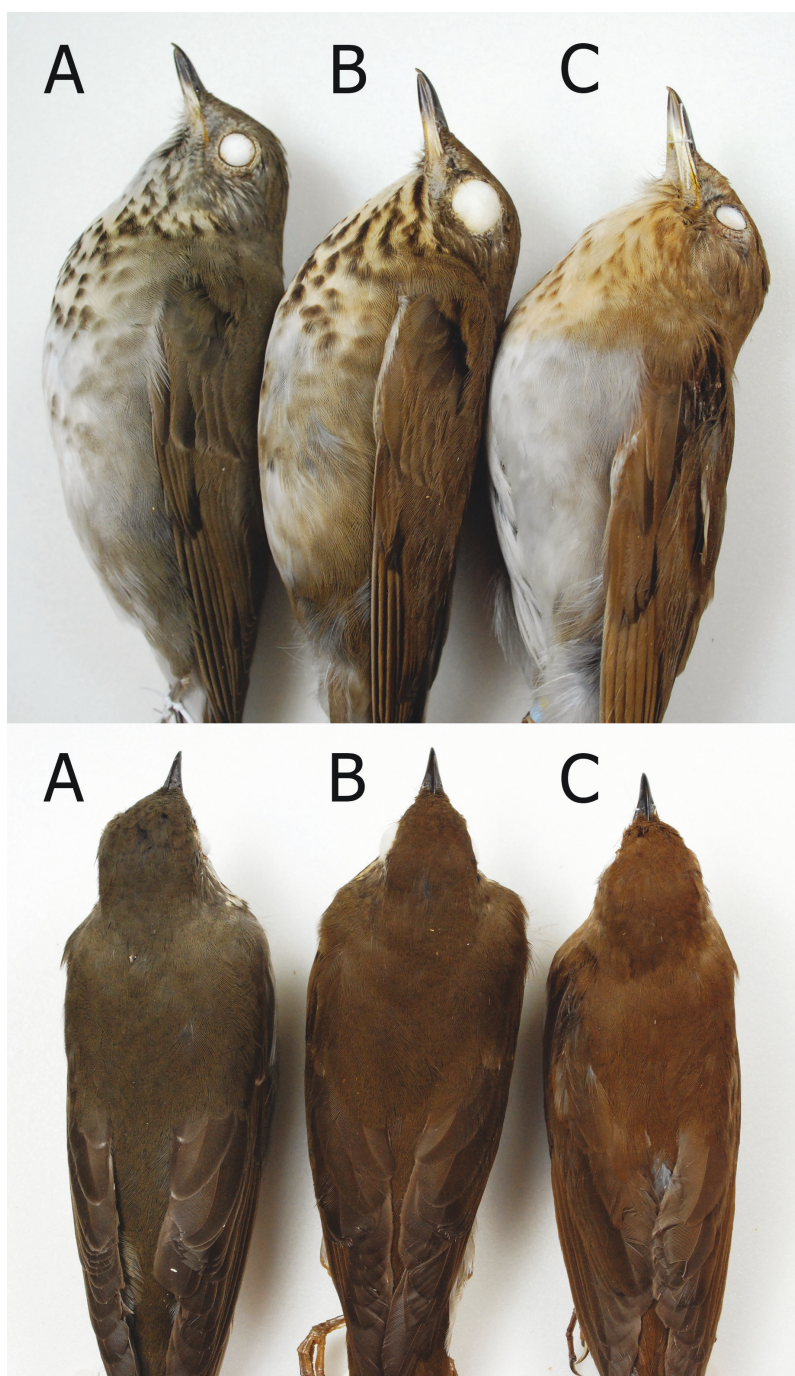


Figure 3. Relatively fresh specimens of Veery *Catharus fuscescens* and Grey-cheeked Thrush *C. minimus* photographed on the same date, under identical lighting conditions, for comparison of plumage coloration: (A) *C. m. aliciae*, ANSP 204020: a male that died in a window collision at Villanova University, Delaware County, PA, salvaged 8 October 2014 and prepared by N. H. Rice; (B) *C. m. minimus*, ANSP 191610: a male that died in a window collision at Cape May Courthouse, Cape May County, NJ, salvaged on 13 October 2002 and prepared by C. Goldman; (C) neotype of *C. f. fuscescens*, ANSP 204310: a colour-banded male (YARX) that died at its breeding site at White Clay Creek State Park, New Castle County, Delaware, USA, salvaged on 9 May 2017 and prepared by M. R. Halley (Matthew R. Halley)



Figure 4. Comparison of cropped images of Tawny Thrush *T. mustelinus* Wilson, in two different original pressings of *American ornithology*, vol. 5, Pl. 43 (1812). The image on left is from Bartram's personal copy, given to him by Wilson and now stored in the library at Bartram's Garden in Philadelphia. It is noticeably dirtier than other plates from the same volume (J. Fry pers. comm.). The image on right, reproduced from a copy of uncertain provenance in the Library of the Academy of Natural Sciences of Drexel University (QL681. W732), is even more discoloured.

(Fig. 4). However, neither the plates, nor the unpublished watercolour and pencil drawing that served as their basis (see Burt & Davis 2013 for a reproduction), bring clarity to the problem that dorsal coloration is shared by more than one species.

Wilson's description of the call of Tawny Thrush ('a sharp chuck') does not clearly match any vocalisation of Veery (Heckscher *et al.* 2017; pers. obs.) and is actually a better match for three other *Catharus* species. One call of Hermit Thrush has often been described as a 'chuck' (e.g., Gross 1949). Marshall (2000) described the introductory note of Grey-cheeked Thrush song as a 'chuck,' and Brewster (1883) likewise wrote that Bicknell's Thrush utters 'a low cluck much like that of the Hermit Thrush.' Veery occasionally gives a 'chatter' call on its breeding grounds, and partial chatter calls sound like a 'chuck' (see Heckscher 2007), but it is highly unlikely that Wilson was referring to this relatively rare (partial) vocalisation. Chatter calls are given by Veery early in the breeding season, and then with reduced frequency as the season progresses (Heckscher 2007), but Wilson's only experience with Tawny Thrush was during migration, when Veery is usually either silent or utters onomatopoeic 'veer' calls (Heckscher *et al.* 2017).

Inexplicably, Wilson (1812) described Tawny Thrush as 'ten inches long, and twelve inches in extent,' which is longer than Wood Thrush by two inches (see Wilson 1808: 29). Bonaparte (1824: 34), who never knew Wilson, but presumably examined specimen no. 5570 in the Peale Museum during his residency in Philadelphia during 1824–26, proclaimed Wilson's measurement a typographical error and gave the 'real length [as] seven inches.' However, this brings us no closer to a conclusive identification because the body sizes of the confused species overlap. The points given by Wilson about timing of migration, and that the breeding grounds of Tawny Thrush were likely 'in the northern districts,' are likewise ambiguous, as were his remarks about there being 'very little difference' between males and females, and that immatures had 'brownish yellow' wing-coverts. These features are shared

by all species of *Catharus* in eastern North America, and all of the specimens cited by Wilson were collected during the migration period, when multiple *Catharus* species would have been passing through Pennsylvania.

That Wilson knowingly gave this species the same English name (Tawny Thrush) that Pennant (1785) gave to Wood Thrush, and the same binomial (*T. mustelinus*) that Gmelin (1789) used for Wood Thrush, further complicates the picture with respect to its true identity. Interestingly, this was not a mistake on Wilson's part, or committed in ignorance of those naturalists; he had in fact cited them in his first volume (Wilson 1808). Wilson simply disagreed with the names that they had chosen. On 29 April 1807, just three weeks after the first plate for *American ornithology* was in Wilson's hands, and five years before his accounts of *T. mustelinus* and *T. solitarius* were published, he discussed the nomenclature of these thrushes in a letter to Bartram:

'The more I read and reflect upon the subject, the more dissatisfied I am with the specific names which have been used by almost every writer. A name should, if possible, be expressive of some peculiarity in colour, conformation, or habit; if it will equally apply to two different species, it is certainly an improper one. Is *migratorious* an epithet peculiarly applicable to the robin? Is it not equally so to almost every species of *turdus* we have?...*Turdus minor* seems also improper; in short I consider this part of the business as peculiarly perplexing; and I beg to have your opinion on the matter, particularly with respect to the birds I have mentioned, whether I shall hazard a new nomenclature, or, by copying, sanction what I do not approve of.' (Transcribed by Hunter 1983: 262.)

Confusion continues

Wilson died on 23 August 1813, 18 months after his account of Tawny Thrush was published on 12 February 1812. In the following years, several European taxonomists noticed Wilson's nomenclatural 'error' and offered replacement names for Tawny Thrush. Stephens (1817, *Turdus fuscescens*) was followed by Vieillot (Bonnaterre & Vieillot 1823: 647, *Turdus silens*) and Bonaparte (1824: 34, *T. Wilsoni*). With the probable exception of Bonaparte, who was temporarily based in Philadelphia, these authors had not seen Wilson's types at the Peale Museum. Bonaparte's replacement name (and its later alternate *wilsonii*) was widely used in America during the early 19th century, giving rise to the colloquial name Wilson's Thrush, but eventually *wilsoni* joined the other synonyms of *fuscescens* Stephens (Baird *et al.* 1858: 214).

Audubon visited the Peale Museum with Wilson in early December 1811, and again when he visited Philadelphia in summer 1824 (Holt 2009, Halley 2015). His original painting of a Tawny Thrush, from which Pl. 164 in *The birds of America* (1827–38) was produced, and to which he applied Bonaparte's (1824) replacement name *T. Wilsonii*, shows a bird that is far greyer than eastern Veery. Rather, it bears a close resemblance to Grey-cheeked Thrush *C. m. aliciae* (Fig. 5). Audubon apparently executed the painting in 1832, although it is undated, from a specimen procured in Maine. In 1863, after his death, the painting was sold to the New-York Historical Society (N-YHS) by his widow Lucy (N-YHS no. 1863.17.164), where it was thereafter stored in almost perpetual darkness, being displayed in the gallery only rarely; and so the grey coloration of the bird is unlikely to be the result of fading. Interestingly, the bird in Pl. 164 of *The birds of America* is not as grey as Audubon's original (Fig. 5), apparently because it was altered by the team of colourists employed by Audubon's engraver, Robert Havell Jr. (1793–1878), to more closely resemble the bird depicted by Wilson (1812).



Figure 5. Comparison of cropped images of Tawny Thrush *T. Wilsonii* (= *T. mustelinus* Wilson) in Audubon's original painting (left) and Pl. 164 of *The birds of America* (right). The original painting (N-YHS no. 1863.17.164) was executed with watercolour, graphite, gouache, black ink, black chalk, pastel, and selective glazing on paper, laid on card. It is reproduced here courtesy of the New-York Historical Society; digital image created by Oppenheimer Editions. The image in Pl. 143 was engraved by Robert Havell Jr. in 1833, with the original painting as a reference, and then hand-coloured by a team of colorists. Reproduced courtesy of the John James Audubon Center at Mill Grove in Audubon, PA, and the Montgomery County Audubon Collection.

Audubon's (1834) account of Tawny Thrush is just as perplexing. He claimed to have heard a Tawny Thrush singing in March 1834, in Charleston, South Carolina! This is within the winter range of Hermit Thrush *C. g. faxoni*, at a time of year when a Veery would be in South America (Heckscher *et al.* 2015). Because Audubon (1831: 303) previously asserted that Hermit Thrush 'has no song, and only utters a soft plaintive note, seldom heard at a greater distance than twenty-five or thirty yards,' the most likely explanation is that he heard a singing Hermit Thrush on its winter grounds, but incorrectly attributed the song to Tawny Thrush. Recall that Wilson (1812) wrote that Tawny Thrush 'has no song, but a sharp chuck.' Thus, Audubon's encounter in March 1834 with a species that gives 'chuck' calls just like Wilson described, presented a coveted opportunity for him to describe a bird song that Wilson had missed. This probably explains why Audubon's description of Tawny Thrush's song is a poor match for Veery, and a better match to Hermit Thrush, the songs of which, unlike Veery, have long been compared to Wood Thrush *H. mustelina* (Stein 1956):

'The song of this species [Tawny Thrush], although resembling that of the Wood Thrush in a great degree, is less powerful, and is composed of continued trills repeated with different variations, enunciated with great delicacy and mellowness, so as to be extremely pleasing to one listening to them in the dark solitudes where the sylvan songster resides. It now and then tunes its throat in the calm of evening, and is heard sometimes until after the day has closed.' (Audubon 1834: 363)

Furthermore, because these shy species are often detected at a distance and identified by voice, Audubon's mistaken attribution of the song probably affected his estimate of Tawny Thrush breeding range during his 1833 expedition to the north shore of the Gulf of St. Lawrence. Audubon's assertion that 'from Massachusetts eastward to Labrador, [Tawny Thrushes] become more and more abundant,' does not accurately describe the modern breeding range of Veery, which does not extend into far eastern Québec ('Labrador' to Audubon); neither does Veery increase in abundance as one travels farther north-east,



Figure 6. Cropped image of Audubon's original painting of Hermit Thrush *T. solitarius* (= *Catharus guttatus faxoni*), showing his mistaken identification ('Tawny Thrush,' crossed out). The painting was executed with watercolour, graphite, pastel, black ink and gouache on paper, laid on card (N-YHS no. 1863.17.58). The inscription in the lower left reads: 'No 12. Plate 58. / Published 1829. / Hermit Thrush Male 1. F. 2. Tawny Thrush [crossed out] / *Turdus solitarius*. Wilson pl. 43. fig. 3. p. 95. / Plant *Bromelia lycis* ... [crossed out]'. The painting was signed below in graphite: 'John. J. Audubon.' Reproduced here courtesy of the New-York Historical Society; digital image created by Oppenheimer Editions.

as Audubon claimed. But the breeding range of Hermit Thrush extends all the way to far eastern Labrador, matching Audubon's description of Tawny Thrush range. This discrepancy supports the hypothesis that when Audubon heard Hermit Thrushes (*C. g. faxoni*) sing in the distance, he incorrectly identified them as Tawny Thrushes; recall, he thought Hermit Thrush was mute (Audubon 1831: 303). Audubon's original painting of Hermit Thrush (N-YHS no. 1863.17.58) provides further evidence that he confused these species: below the image, Audubon initially labelled his illustration 'Tawny Thrush,' but sometime later crossed it out and wrote 'Hermit Thrush' (Fig. 6).

In summary, although Audubon had multiple opportunities to see Wilson's types, his original painting of *T. mustelinus* Wilson looks more like a Grey-cheeked Thrush than a Veery, and he apparently attributed the song of Hermit Thrush *C. g. faxoni* to *T. mustelinus* Wilson. We can therefore conclude that Audubon did not distinguish the species now known as Veery from the amalgamation of *T. minor*, and neither did Wilson (1812), who merely split one amalgamation (*T. minor*) into two (*T. solitarius*, *T. mustelinus*).

Neotype designation for *Turdus mustelinus* Wilson and its replacement names, including *T. fuscescens* (Stephens)

The name *fuscescens* Stephens, 1817, has been in universal use for Veery in New World and global ornithological literature for c.160 years, at least since Baird *et al.* (1858). It is also a replacement name for *Turdus mustelinus* Wilson, 1812, preoccupied by *Turdus mustelinus* J. F. Gmelin, 1789, and is therefore typified by the type material of *mustelinus* Wilson under



Figure 7. ANSP 204310, the neotype of *Turdus mustelinus* Wilson (= *Catharus f. fuscescens*), see text for detail of the specimen's provenance (Matthew R. Halley)

Art. 72.7 of the *Code* (ICZN 1999). It is not, however, unambiguously identifiable because none of its type material is extant or traceable, and the attributes described in the original description of *T. mustelinus* Wilson are shared by more than one species. To fix the taxonomic identity of *Turdus fuscescens* Stephens, 1817, so that traditional nomenclature is maintained and to prevent destabilising confusion arising from alternative identifications, I hereby designate as its neotype ANSP 204310, a colour-banded male deposited in the collection of the Academy of Natural Sciences of Drexel University, Philadelphia. This action fulfills the requirements for neotype designation in the *Code* (ICZN 1999) by: clarifying the taxonomic application (status) of the name, as explained above (Art. 75.3.1), describing, illustrating and referencing the defining characters of Veery and its neotype (Art. 35.3.2), providing data sufficient to ensure recognition of the specimen designated (Art. 75.3.3), providing grounds for believing that all original type material has been lost and is untraceable (Art. 75.3.4), showing that traits of the neotype are included in the original description (Art. 75.3.5), choosing the neotype from a locality in the same physiographic province (second-growth Mid-Atlantic Piedmont forest) where Wilson collected some of his type material (Art. 75.3.6), and recording that the neotype is preserved as the property of a recognised scientific institution (Art. 75.3.7).

The neotype of *C. fuscescens* is one of the most data-rich specimens of any migratory bird, because the geographic coordinates of its breeding territory in northern Delaware, USA (39°73'98.27"N, 75°75'66.63"W) and of its first wintering site in Mato Grosso, Brazil (10°74'21.50"S, 56°45'99.83"W), were estimated in 2015 using a GPS tracking device attached with a harness. The bird was also tracked in 2016 with a light-level geolocator (C. M. Heckscher unpubl. data; methods in Heckscher *et al.* 2011). To my knowledge, this is the only bird specimen in any collection for which migratory data have been collected using either tracking device. The neotype was banded on 9 June 2015 by M. Mancuso (YARX; left: yellow / azure, right: red / aluminum, with USGS serial no. 271151219) at a long-term research site in Delaware, USA, where it bred in second-growth Mid-Atlantic Piedmont forest. This breeding population has been studied by C. M. Heckscher and his students (including myself) since 1998 (see Heckscher 2007, Halley & Heckscher 2012, Halley *et al.* 2016).

YARX was recaptured by M. Mancuso on 9 May 2017, close to where it had been detected during previous breeding seasons. However, when YARX was extracted from the mist-net, its left wing was found to be wounded near the carpal joint. The wound was not fresh, but also did not appear to be more than a day or two old. The bird was lethargic and died en route to a nearby bird rescue facility. A tick was removed from the edge of the eye and stored in 95% ethanol. The body of YARX was frozen and transported to the Delaware Museum of Natural History, Wilmington, and from there legally transferred to ANSP, where I prepared it as a study skin (prep. = MRH114), extracted frozen tissue samples (liver, heart, muscle: ANSP Tissue 33456), and excised the syrinx (initially stored in 95% ethanol, transferred to 10% neutral buffered formalin). Body mass with no fat was 27.4 g. The skull was 90% ossified and there was no bursa. Both testes were enlarged (10 × 8 mm) and dark grey. There was no discernible moult, and black insect parts were found in its stomach.

Through neotypification, the name *fuscescens* is now restricted to populations of Veery that breed in eastern North America, to which the name *C. f. fuscescens* has traditionally been applied. The breeding range of *C. f. fuscescens* has been amended to include the region 'from Ontario east to New Brunswick and southern Nova Scotia and south through the Appalachians to northwestern Georgia' (Heckscher *et al.* 2017). Thus, nomenclature has been resolved and stabilised, and new light has been thrown on a particularly obscure chapter in the history of American ornithology.

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References:

- Anon. 1865. Disastrous fire. *The New York Times* 14 July 1865: 1.
- Audubon, J. J. 1831. *Ornithological biography*, vol. 1. Adam Black, Edinburgh.
- Audubon, J. J. 1834. *Ornithological biography*, vol. 2. Adam & Charles Black, Edinburgh.
- Allen, E. G. 1951. The history of American ornithology before Audubon. *Proc. Amer. Phil. Soc.* 41: 532–534.
- Baird, S. F., Cassin, J. & Lawrence, G. 1858. *Explorations and surveys for a railroad route from the Mississippi River to the Pacific Ocean*, vol. 9(2). Beverly Tucker, Washington DC.
- Bangs, O. & Penard, T. E. 1921. The name of the eastern Hermit Thrush. *Auk* 38: 432–434.
- Bartram, W. 1791. *Travels through North and South Carolina, Georgia, east and west Florida, the Cherokee country, the extensive territories of the Muscogulges or Creek Confederacy, and the country of the Chactaws. Containing an account of the soil and natural productions of those regions; together with observations on the manners of the Indians*. James & Johnson, Philadelphia, PA.
- Bonaparte, C. L. 1824. Observations on the nomenclature of Wilson's ornithology. *J. Acad. Nat. Sci. Philadelphia* 4: 25–66.
- Bonnaterre, P. J. & Vieillot, L. P. 1823. *Tableau encyclopédique et méthodique des trois règnes de la nature. Ornithologie*, vol. 4. Second edn. Panckoucke, Paris.
- Brewer, T. M. 1844. Minutes of the July 17 meeting. *Proc. Boston Soc. Nat. Hist.* 1: 190–191.
- Brewster, W. 1883. Bicknell's Thrush (*Turdus aliciae bicknelli*) in New England. *Bull. Nuttall Orn. Cl.* 8: 12–17.
- Brisson, A. D. 1760. *Ornithologia sive synopsis methodica sistens avium divisionem in ordines, sectiones, genera, species, ipsarumque varietates*, vol. 2. Joannem-Baptistam Bauche, Paris.
- Burleigh, T. D. & Peters, J. L. 1948. Geographic variation in Newfoundland birds. *Proc. Biol. Soc. Wash.* 61: 111–126.
- Burt, E. H. & Davis, W. E. 2013. *Alexander Wilson: the Scot who founded American ornithology*. Belknap Press, Harvard Univ., Cambridge, MA.

- Catesby, M. 1731. *Natural history of Carolina, Florida and the Bahama Islands*, vol. 1. Privately published, London.
- Coues, E. 1878. *Birds of the Colorado Valley*. US Geological Survey, Dept. of the Interior Misc. 11. Washington DC.
- Edwards, G. 1760. *Gleanings of natural history, exhibiting figures of quadrupeds, birds, fishes, insects, &c.*, pt. II. Royal College of Physicians, London.
- Faxon, W. 1901. Early editions of Wilson's ornithology. *Auk* 18: 216–218.
- Faxon, W. 1915. Relics of Peale's Museum. *Bull. Mus. Comp. Zool.* 59: 119–148.
- Feduccia, A. 1985. *Catesby's birds of colonial America*. Univ. of North Carolina Press, Chapel Hill, NC.
- FitzGerald, A. M., Whitaker, D. M., Ralston, J., Kirchman, J. J. & Warkentin, I. G. 2017. Taxonomy and distribution of the imperilled Newfoundland Gray-cheeked Thrush, *Catharus minimus minimus*. *Avian Conserv. & Ecol.* 12(1): 10.
- Forster, J. R. 1771. *A catalogue of the animals of North America*. B. White, London.
- Gmelin, J. F. 1789. *Caroli a Linne, Systema naturae per regna tria natural, secundum classes, ordines, genera, species cum characteribus differentiis, synonymis, locis*, vol. 1(2). J. B. Delamollière, Lyon.
- Gross, A. O. 1949. Hermit Thrush *Catharus guttatus*. Pp. 143–162 in Bent, A. C. (ed.) *Life histories of North American thrushes, kinglets, and their allies*. US Natl. Mus. Bull. 196.
- Halley, M. R. 2015. The heart of Audubon: five unpublished letters (1825–1830) reveal the ornithologist's dream and how he (almost) achieved it. *Common-place.org* 16(1).
- Halley, M. R. & Heckscher, C. M. 2012. Multiple male feeders at nests of the Veery. *Wilson J. Orn.* 124: 396–399.
- Halley, M. R., Heckscher, C. M. & Kalavacharla, V. 2016. Multi-generational kinship, multiple mating, and flexible modes of parental care in a breeding population of the Veery (*Catharus fuscescens*), a trans-hemispheric migratory songbird. *PLoS ONE* 11(6): e0157051.
- Heckscher, C. M. 2007. Use of the Veery (*Catharus fuscescens*) call repertoire in vocal communication. Ph.D. thesis. Univ. of Delaware, Newark.
- Heckscher, C. M., Taylor, S. M., Fox, J. W. & Afanasyev, V. 2011. Veery (*Catharus fuscescens*) wintering locations, migratory connectivity, and a revision of its winter range using geolocator technology. *Auk* 128: 531–542.
- Heckscher, C. M., Halley, M. R. & Stampul, P. M. 2015. Intratropical migration of a Nearctic-Neotropical migratory songbird (*Catharus fuscescens*) in South America with implications for migration theory. *J. Trop. Ecol.* 31: 285–289.
- Heckscher, C. M., Bevier, L. R., Poole, A. F., Moskoff, W., Pyle, P. & Patten, M. A. 2017. Veery (*Catharus fuscescens*), version 3.0. In Rodewald, P. G. (ed.) *The birds of North America*. Cornell Lab of Ornithology, Ithaca, NY. <https://doi.org/10.2173/bna.veery.03>.
- Holt, J. 2009. Wilson, Audubon, Ord and a flycatcher. *Cassinia* 70: 11–21.
- Howe, R. H. 1900. A new subspecies of the genus *Hylocichla*. *Auk* 17: 271.
- Hunter, C. (ed.) 1983. *Life and letters of Alexander Wilson*. American Philosophical Society, Philadelphia, PA.
- ICZN (International Commission on Zoological Nomenclature). 1999. *International code of zoological nomenclature*. Fourth edn. The International Trust for Zoological Nomenclature, London.
- Lafresnaye, M. F. de. 1848. Description de quelques oiseaux nouveaux de Caracas (province de Venezuela) et de Bogota. *Rev. Zool. Soc. Cuvierienne* 11: 2–12.
- Lysaght, A. M. 1971. *Joseph Banks in Newfoundland and Labrador, 1766*. Univ. of California Press, Berkeley & Los Angeles.
- Marshall, J. T. 2000. *The Gray-cheeked Thrush Catharus minimus, and its New England subspecies, Bicknell's Thrush, Catharus minimus bicknelli*. Smithsonian Press, Washington DC.
- Nelson, E. C. 2017. "Honored Sir": Mark Catesby's letters from Carolina, 1722–1725. *Carologue* (spring 2017): 18–23.
- Pennant, T. 1785. *Arctic zoology*, vol. 2. Henry Hughs, London.
- Ridgway, R. 1882. Descriptions of two new thrushes from the United States. *Proc. US Natl. Mus.* 4: 374–379.
- Stanton, L. 2013. Thomas Jefferson and Virginia's natural history. *Banisteria* 41: 5–16.
- Stein, R. C. 1956. A comparative study of "advertising song" in the *Hylocichla* thrushes. *Auk* 73: 503–512.
- Stephens, J. F. 1817. *General zoology, or Systematic natural history*, vol. 10(1). London.
- Trotter, S. 1907. Type birds of eastern Pennsylvania and New Jersey. *Cassinia* 11: 17–27.
- Tschudi, J. J. von. 1845. *Untersuchungen über die Fauna Peruana*. Scheitlin & Zollikofer, St. Gallen.
- Wallace, G. J. 1939. Bicknell's Thrush, its taxonomy, distribution, and life history. *Proc. Boston Soc. Nat. Hist.* 41: 211–402.
- Wilson, A. 1808. *American ornithology, or, the natural history of the birds of the United States*, vol. 1. Bradford & Inskeep, Philadelphia, PA.
- Wilson, A. 1812. *American ornithology, or, the natural history of the birds of the United States*, vol. 5. Bradford & Inskeep, Philadelphia, PA.
- Yong, W. & Moore, F. R. 1993. Relation between migratory activity and energetic condition among thrushes (Turdinae) following passage across the Gulf of Mexico. *Condor* 95: 934–943.
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