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## The white dodo of Réunion Island: unravelling a scientific and historical myth

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**ABSTRACT:** The supposed white dodo of Réunion Island (Indian Ocean) arose from a merging of travellers' tales of large whitish birds with some enigmatic paintings of white dodos painted in mid- to late- seventeenth-century Holland. Sub-fossil bone discoveries in the 1970s onwards revealed that the bird which travellers called a solitaire was a large, quasi-flightless ibis, while the Dutch paintings turn out to have been based on a much earlier picture by Roelant Savery of a whitish specimen of a Mauritius dodo (*Raphus cucullatus*), painted in Prague around 1611. Savery's dodo images impact on this story at various points and are discussed in detail. There are geological reasons for believing dodos, evolving in Mauritius, would have been already flightless before Réunion emerged and hence could not have colonised that more recent volcanic island. No contemporary images are known of the Réunion solitaire (the ibis, *Threskiornis solitarius*) and no specimens were brought to Europe alive or dead.

**KEY WORDS:** Holsteyn – Withoos – Savery – solitaire – *Ornithoptera solitaria* – *Raphus cucullatus* – *Threskiornis solitarius* – Mauritius – Rodrigues – Mascarenes.

### INTRODUCTION

The former existence of a whitish-coloured species of dodo on Réunion Island, distinct from the well-known grey dodo (*Raphus cucullatus*) of neighbouring Mauritius, has been generally accepted by ornithologists for nearly two centuries, but is based on a series of misconceptions and erroneous attributions. The description in 1987, from sub-fossil bones, of an extinct, quasi-flightless ibis, combined with the continued failure to find dodo-type remains on Réunion, has made the likelihood of such a dodo increasingly untenable, but for the existence of a series of seventeenth-century Dutch paintings depicting white dodos. In this paper we review the developments that led to the “Réunion white dodo” becoming a scientific reality, and offer a new explanation for the images of white dodos in the enigmatic Dutch paintings. A short note on the geological history of the islands is added to demonstrate that it is most unlikely that any dodo could have reached Réunion.

### TRAVELLERS' OBSERVATIONS OF LARGE WHITE BIRDS ON RÉUNION

When Ysbrantz Bontekoe (1646), unable to reach Mauritius because of contrary winds, stopped in Réunion in 1619 to allow his sick sailors to recover on shore, he claimed to have seen, amongst other birds, “dodos that had small wings yet could not fly, they were so fat they could scarce move and as they walked they dragged their backend on the ground” (Bodde-Hodgkinson and Geyl, 1929).<sup>1</sup> Although not a single, subsequent visitor reported dodos, this report by the famous Dutch adventurer was the foundation of a belief in a Réunion

dodo that has persisted to the present time.

Beginning in 1646, the French made increasing use of Réunion, first as a bolt-hole from Madagascar and a place to exile unruly colonists, and later as a settlement and way-station to India (Guet, 1888; Loughon, 1970; Toussaint, 1972). French accounts (see Cheke, 1987) referred regularly to a bird called a solitaire, which was the size of a turkey, whitish with black wing-tips and tail, a beak like a woodcock (Dubois, 1674; Oliver, 1897) and iridescent neck and wing feathers (Sauvaget, 1999; Mourer *et alii*, 1995b).<sup>2</sup> According to Dubois (1674) it could fly but rarely did so. Feuilley, who visited Réunion in 1704 (Loughon, 1939), described its diet as “worms and filth taken in or on the soil” (Cheke, 1987; Mourer *et alii*, 1995a, 1995b) This bird roughly matches the earliest report: Tatton’s account in 1613 (Purchas, 1905: 3: 351–352) of an unnamed “great fowl the bigness of a turkie, very fat, and so short-winged that they cannot flie, beeing white”. Unlike Mauritian dodos, several of which were taken alive to Europe, India and Java (Cheke, 1987), the only recorded attempt to transport Réunion solitaires by ship ended in their rapid death. In 1667 Abbé Carré took two on board for eventual presentation to the French king (Loughon, 1970), but reported that “as soon as they were in the vessel they died of melancholy, not wanting to drink or eat”.<sup>3</sup> In 1691 the French Huguenot refugee François Leguat and some companions attempted to settle on Rodrigues Island, 574 kilometres east of Mauritius, and stayed two years (Leguat, 1707; North-Coombes, 1991). Leguat later wrote about a large flightless bird he had watched there, calling it a solitaire, borrowing the name from a tract that his sponsor, the Marquis Henri Duquesne, had written about Réunion, the originally intended locale for the fledgling settlement (Racault, 1995).<sup>4</sup>

#### SCIENTIFIC INTERPRETATION OF TRAVELLERS’ ACCOUNTS

In the mid-eighteenth century European encyclopaedists compiled the first critical and comprehensive works on the world’s plants and animals, and Buffon (1770–1783), in his volumes on birds, included the following remarks in his article on the dodo: “The Dodo appears to be a native of and particular to Mauritius and Réunion, and probably the lands of that continent which are the least far away; but I am unaware that any voyager has mentioned seeing them anywhere but these two islands.”<sup>5</sup> Quite why Buffon incorporated Réunion into the dodo’s distribution is not clear, as he appears to have been unaware of Bontekoe’s travels. Under his solitaire Buffon combined Leguat’s bird in Rodrigues and Carré’s account from Réunion with a bird François Cauche (1651) called “oiseau de Nazareth” seen on Mauritius (clearly, from the description, a dodo). Buffon thus appeared to believe that Réunion was home to both a dodo and a solitaire.<sup>6</sup> By this time, the Mauritian dodo had been named *Raphus cucullatus* and later *Didus ineptus* by Linnaeus (see Table 1 for a summary nomenclature), the former name eventually becoming accepted under the rules of zoological nomenclature; the Rodrigues solitaire was called *Didus solitarius* by Gmelin in 1788 (Hachisuka, 1953; see also Table 1).

After a period when the lack of specimens caused many to believe the dodo was a mythical creature<sup>7</sup>, its reality was resurrected by, *inter alia*, Duncan (1828), Blainville (1829) and, most famously, Strickland (Strickland and Melville, 1848). Strickland, who was the first to examine actual remains of the Rodrigues solitaire, realised its generic distinctiveness and created the new genus *Pezophaps* for the species, while keeping it close to the dodo as a relative of the pigeons. The separation of dodos and solitaires into a separate family Raphidae in the

TABLE 1. Scientific names of dodos and solitaires. Although these have been given *passim* in the text, we felt it might help clarity to tabulate the various names and their synonyms (see Hachisuka (1953) for a complete nomenclatural history to that date).

	<b>Current name</b>	<b>Other citations</b>
Mauritius (or Grey) dodo	<i>Raphus cucullatus</i> Linnaeus 1758	<i>Didus ineptus</i> Linnaeus 1766
Rodrigues solitaire	<i>Pezophaps solitarius</i> (Gmelin)	<i>Didus solitarius</i> Gmelin 1788
Réunion “solitaire” = ibis	<i>Threskiornis solitarius</i> (Sélys)	<i>Borbonibis latipes</i> Mourer & Moutou 1987
“Réunion (or White) dodo”	<i>Ornithoptera solitaria</i> (Sélys)  <i>Raphus solitarius</i> (Sélys)	<i>Apterornis solitarius</i> Sélys-Longschamps 1854  <i>Didus solitarius</i> (Sélys)  <i>D. apterornis</i> [comb. nudum]  <i>Victoriornis imperialis</i> Hachisuka 1937 (part)

Columbiformes was first proposed by Fürbringer in 1888 (Hachisuka, 1953). The shortage of material evidence was due to the dodo and solitaires becoming extinct before systematic natural history collections were established: the Mauritius dodo was last reliably reported in 1662, the Réunion solitaire in 1708, and the Rodrigues solitaire in 1755 (Cheke, 1987).

In the first part of *The dodo and its kindred* (Strickland and Melville, 1848), Strickland reviewed the historical evidence available to him, and brought together four old accounts from Réunion, those of Tatton, Bontekoe, Carr, and Dubois. He pointed out that Bontekoe had borrowed a Mauritian dodo to illustrate an edition of his account and that Dubois’ more detailed description indicated a somewhat different type of bird. He cautiously concluded that “Bourbon [Réunion] was formerly inhabited by a brevipedate bird called the solitaire, whose white or light yellow plumage and woodcock-like beak proves it to have been distinct from the dodo of Mauritius and from the so-called solitaire of Rodrigues” (Strickland and Melville, 1848: 59). Sélys-Longchamps (1848) promptly gave this bird the name *Apterornis solitarius* (Hachisuka, 1953; see also Table 1)<sup>8</sup>, and Schlegel (1854: 389) attempted a pictorial reconstruction from the descriptions, his drawing (Figure 1) resembling an ibis or stork (Figure 2) rather than a dodo.

#### THE WHITE DODO PAINTINGS – DISCOVERY, INTERPRETATION AND SPECULATION

In 1856 William Coker was shown by a friend a small painting, claimed as from Persia (but later identified as by Pieter Withoos), of a dodo, pure white with a yellow wing, posed amongst typically European waterfowl by the waterside (Figure 3). Coker’s (1856) letter to the *Illustrated London news* was accompanied by a poor copy of the image and an editorial note quoting John Gould, who suggested “that the artist had made his sketch of the dodo from a Mauritius or Bourbon specimen, for we have no evidence that this bird was ever found elsewhere”. William Tegetmeier (1866) rediscovered this painting, after which Alfred Newton (1869) devoted a long article to it, identifying the artist and endorsing the emergent

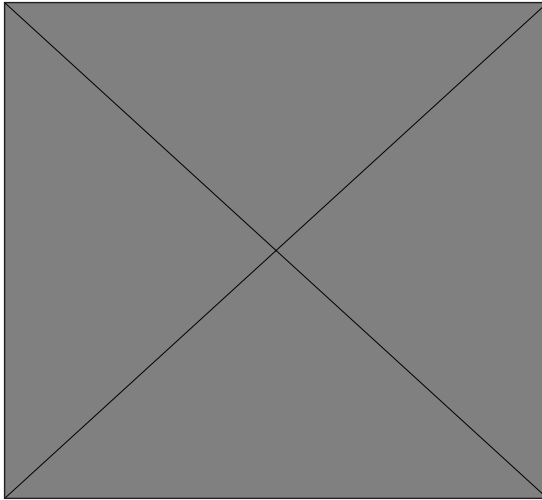


Figure 1. Hermann Schlegel's reconstruction of the Réunion solitaire (from Schlegel, 1854). © The Natural History Museum, London; reproduced by permission.

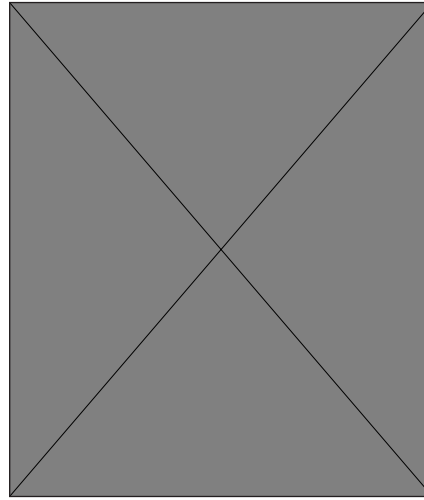


Figure 2. Sketches of heads of sacred ibis, *Threskiornis aethiopica*, Réunion "solitaire" (= ibis) *T. solitaria*, and woodcock, *Scolopax rusticola* (J. P. Hume).

view that it must represent the big extinct bird from Réunion.<sup>9</sup> Newton also surmised that a living example had been brought from Réunion to Holland.<sup>10</sup> Thus did the descriptions of the Réunion solitaire and this dodo image become merged into the "White Dodo of Réunion".<sup>11</sup> Newton's interpretation became the orthodox view and was endorsed and expanded on by Oliver (1897), Rothschild (1907, 1919), and Oudemans (1917, 1918). Oudemans (1918) baldly stated "as is well-known, the White Dodo (*Apterornis solitarius* Sélys) inhabited the island of Mascarenhas (Bourbon)".

Around the same time that the Withoos painting was discovered in England, two other white dodo paintings were discovered in Holland (Millies, 1868), the work of a different artist, Pieter Holsteyn. Only one was in the public domain; it was originally attributed to the elder Holsteyn, and estimated to date from around 1638. Unlike their British contemporaries, neither Millies (1868) nor Biederman (1898), who published a list of dodo images, thought this painting represented a bird from Réunion, but assumed it was a white-coloured Mauritian dodo. Three white dodo paintings by Holsteyn are now known: one is preserved in the Teyler's Museum, Haarlem (Plomp, 1997; Ziswiler, 1996), and another in The Natural History Museum, Tring (Figure 5). The whereabouts of the third, reproduced by Oudemans (1917), is uncertain.<sup>12</sup>

#### **Pieter Holsteyn, father and son**

The Holsteyn and Withoos paintings are clearly cognate (Figures 3 and 5). The Holsteyn bird paintings, following recent research (Dumas and Rijdt, 1994; Plomp, 1997; *contra* Jackson, 1999) are now attributed the younger Pieter Holsteyn (1614–1687) and not to his father Pieter Pietersz Holsteyn (1585–1662).<sup>13</sup> There was a school of Dutch bird painting during the period 1670–1700 in which several artists, including Rochus van Veen, Johannes Bronkhurst and Pieter Withoos, produced similar work. The corpus of Holsteyn birds fits this style closely, suggesting the commonly accepted date of 1638 for the dodo paintings is wrong (Dumas

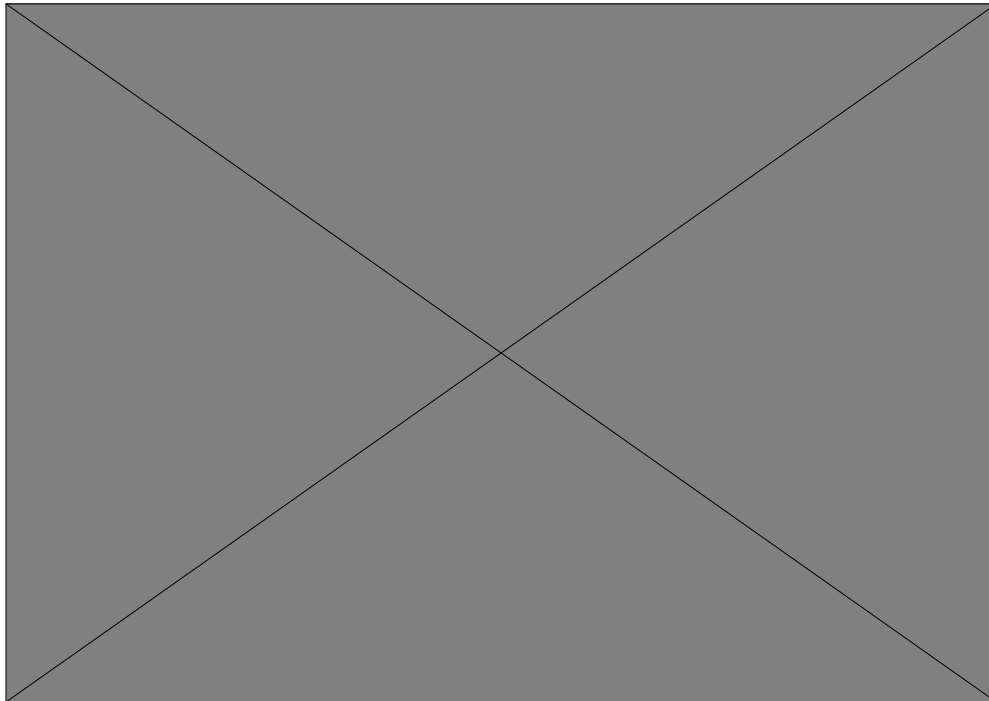


Figure 3. The Withoos white dodo: the original by Pieter Withoos in the library of the Rothschild Museum, The Natural History Museum, Tring. © The Natural History Museum, London; reproduced by permission.

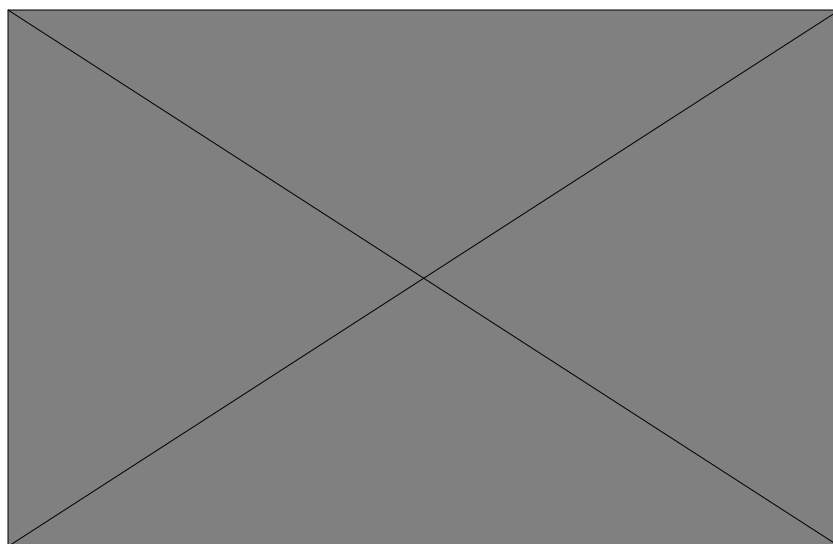


Figure 4. The Withoos white dodo. Copy by Joseph Smit, reworked and with fewer birds (from Newton, 1867). © The Natural History Museum, London; reproduced by permission.

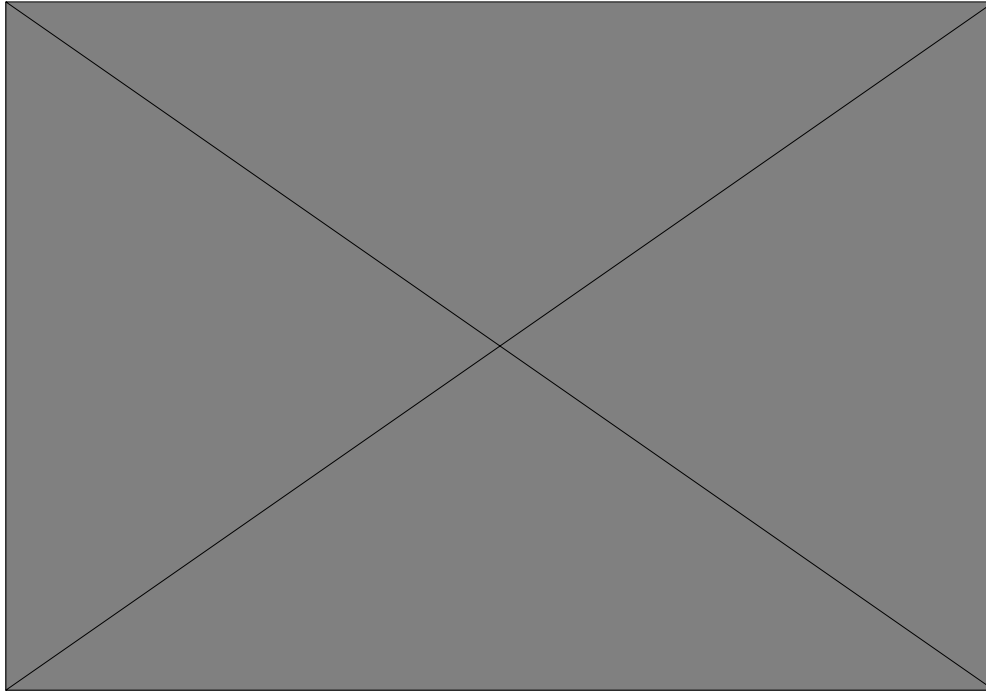


Figure 5. Pieter Holsteyn's white dodo. Previously unpublished original (reference 88 o H) in The Natural History Museum, London. This painting differs only in minor details from the two others by this artist, one in the Teylers Museum, Haarlem, the other of unknown current location. © The Natural History Museum, London; reproduced by permission.

and Rijdt, 1994). By 1670 the elder Holsteyn was dead and, in any case, an earlier work of his (from 1621) shows a distinctly different style of depicting birds (Plomp, 1997).

#### **Pieter Withoos and the multiplication of a single original**

Pieter Withoos (1654–1693), second son and pupil of artist Matthias Withoos (1627–1693) (Warr, 1996; Jackson, 1999), specialised in birds, insects and flowers, and clearly copied his white dodo from the (putatively) earlier and less elaborate Holsteyn compositions, as already noted by Cheke (1987) and Ziswiler (1996). The literature suggests that there are (or were) two (Oudemans, 1917; Hachisuka, 1953; Fuller, 2002) or “several” (Fuller, 1987) Withoos originals, but this is due to misinterpretation. Oudemans (1917) and Hachisuka (1953) used minor differences in verbal descriptions to conclude that the painting discussed by Coker (1856) was not the same as that “discovered” by Tegetmeier (1866) and discussed by Newton (1869). They ignored Newton's clear statement that both the earlier articles were discussing the same original, then in the hands of Mr C. Dare of Clattenford in the Isle of Wight. Hachisuka (1953) and Fuller (1987) assumed the Coker painting was missing and were unaware of the whereabouts of the Tegetmeier one following Lord Rothschild's death. In fact the sole original in Britain was sold to Lord Rothschild on the death of Mr Dare in 1918 (Rothschild, 1919), and remains in the library of the Rothschild Museum in Tring, now part of The Natural History Museum (see colour reproduction in Warr, 1996:



frontispiece).<sup>14</sup> Rothschild (1919) himself claimed there was a second Withoos white dodo, but in Holland – we think this was imaginary, as Marijke Besselink, who has researched dodo paintings there, has been unable to trace any additional Withoos dodos.<sup>15</sup> A further source of confusion is that Newton (1867) illustrated his article with a copy of the Withoos, re-worked in mirror-image by Joseph Smit (see Figure 4); it is this one, lacking several of the birds in Withoos' original, that is often reproduced and cited as the “Withoos” (e. g. Oudemans, 1917; Oliver, 1897; Lougnon, 1970; Ziswiler, 1996; Fuller, 1987, 2001). Oudemans (1917) even reproduced the dreadful woodcut from the *Illustrated London news* (Coker, 1856) as an original Withoos.

### Misinterpretations on a grand scale

By the early 1900s, with only the pictures and travellers' descriptions to work with, some writers gave themselves over entirely to speculation. Oudemans (1917, 1918) convinced himself he could distinguish the two sexes of white dodo and discussed their mating habits and fat-cycle.<sup>16</sup> He even argued that an almost black dodo painted by Hoefnagel in Prague<sup>17</sup>, a dodo attributed to Goeimare<sup>18</sup>, a head by Saftleven (see below) and the large grey dodo by Jan Savery in Oxford were plumage varieties of the white dodo (all reproduced in Ziswiler, 1996). Rothschild (1919), discussing his recently acquired Withoos painting, also speculated on sex differences. Renshaw (1938) endorsed Oudemans' ideas and went on to claim for the white dodo a skull in Prague and “two skeletons in Cambridge” – not bad for a bird with no physical remains.<sup>19</sup> Hachisuka (1937, 1953) went so far as to propose that the discrepancies between travellers' descriptions meant there must have been two species of “didine” bird on Réunion, a dodo and a solitaire, thus inadvertently reviving Buffon's supposition from the 1770s. To the dodo, which he called *Victoriornis imperialis*<sup>20</sup>, he assigned the white dodo paintings and the accounts of fat birds by Tatton<sup>21</sup> and Bontekoe; to the solitaire, retaining Séllys-Longchamps' name *Ornithaptera solitaria*, he assigned the taller athletic birds reported by Dubois and Carré (reproduced in Lougnon, 1970). For Mauritian dodos, Hachisuka (1953) readily accepted Oudemans' suggestion (1917) that variations in appearance could be accounted for by a seasonal fat-cycle<sup>22</sup> and age/sex differences, but applied totally different criteria to the Réunion birds. Only Greenway (1958), Lüttschwager (1961) and Storer (1970) sounded notes of caution. Greenway (1958) pointed out that there was no reason to believe in two species on Réunion and nothing firm to link the Withoos painting to that island, although he nonetheless accepted the attribution. Lüttschwager (1961) noted that the Withoos image proved nothing without solid evidence from bones. Storer (1970) warned against attempting to assign the Réunion bird to either of the existing Raphid genera when there was nothing material to go on. This trend had started with Schlegel (1854), but was followed initially by only a minority of writers (e. g. Newton, 1888; Kinnear, 1937; Berlioz, 1946; Greenway, 1958). Bizarrely it has actually accelerated since Storer's admonition (e.g. Morony *et alii*, 1975; Walters, 1980; Fuller, 1987; Balouet and Alibert, 1990; Monroe and Sibley, 1993; Gibbs *et alii*, 2001, all of whom included the Réunion bird in *Raphus*).<sup>23</sup> These authors all ignored Storer's important additional warning: “I predict that if and when remains of such birds are found on Réunion, they will prove to be unrelated to either to the Dodo or the [Rodrigues] Solitaire, and I would not be surprised if they proved to be derived from rails or some group other than pigeons”. How right he turned out to be.

### THE SUB-FOSSIL IBIS AND ITS RECOGNITION AS THE TRAVELLERS' SOLITAIRE

In 1974 the first sub-fossil bird remains were found on Réunion but they were not reported on until 1987; they included a bone described by Cowles (1987) as from a stork (*Ciconia* sp.). Further excavations resulted in more Ciconiiform bones which were assigned by Mourer and Moutou (1987) to a new and extinct species of ibis (*Borbonibis latipes*); Cowles (1994) subsequently confirmed that his “stork” bone belonged to this ibis. The 1987 publication prompted one of us (ASC) to suggest to François Moutou, one of the co-authors, that the new ibis was in fact the solitaire of the old accounts.<sup>24</sup> However it was not until 1995 that they confirmed this identity in print, adopting Séllys-Longchamps' specific epithet *solitarius*, and re-assigning the bird to the sacred ibis genus *Threskiornis* (Mourer *et alii*, 1995a, 1995b, 1999). Despite intensive searches in recent years (Mourer *et alii*, 1999) no dodo-type bones have been found, but this has not prevented some authors from using the white dodo pictures to maintain a belief (Gibbs *et alii*, 2001) or a hope (Fuller, 2001, 2002) that there was also a dodo on Réunion.

### THE REAL ORIGIN OF THE WHITE DODO PAINTINGS

Until now the basis for Holsteyn's white dodos (and hence Withoos's copy) has remained obscure. This has permitted speculation that living white dodos were taken from Réunion to Holland in the mid-1600s. Before presenting our new evidence we should say that this argument was always weak. Dutch vessels rarely called at Réunion, which has no natural harbour, preferring the much better anchorages at Mauritius (Moree, 1998). We know of Dutch landings only in 1612 (Brial, 2001), 1619 (Bontekoe, 1646), and two in 1663 (Chijs, 1891); itineraries for all Dutch voyages are given in Bruijn *et alii* (1979–1987). The 1663 visits were at around the right period for live birds to be in Holland around 1670, the revised date for Holsteyn's paintings, but in both cases the Dutch ships were heading to the Far East, not Europe.

This speculation becomes irrelevant as we have discovered the original from which Holsteyn's dodos were derived. It is a painting entitled “Landscape with Orpheus and the animals” (Figure 6) painted by Roelant Savery in or about 1611 (see Müllenmeister, 1988: plate 37), previously unappreciated by ornithologists.<sup>25</sup> Savery was at that time contracted, as were so many other Dutch and Flemish artists, to the court of the Holy Roman Emperor, Rudolf II, in Prague. Savery's main job was to paint Tyrolean and other landscapes, to which he also added classical and mythological themes, in which he included numerous animals and birds (Müllenmeister, 1985, 1988, 1991). In the 1611 painting, Savery included in the bottom right-hand corner a small white dodo with a yellow wing. This is the earliest of Savery's many dodo images, the only one to show a white bird, and the only one done in Prague. The manuscript catalogue of the imperial collection by Daniel Fröschl, compiled between 1607 and 1611, includes as item number 135 the following: “1 Indian stuffed bird, called a *walghvogel* by the Dutch according Carolus Clusius. It has a great round body the size of a goose or larger, an ugly large beak, small wings which preclude it from flying, and a *dirty off-white colouring* [our italics]” (Wissen, 1995; Bauer and Haupt, 1976).<sup>26</sup> Thus in Prague in 1611 there was a whitish specimen of a dodo *from Mauritius*, which Savery slipped into the corner of his “Landscape with Orpheus ...” painting. The stance, the direction the bird

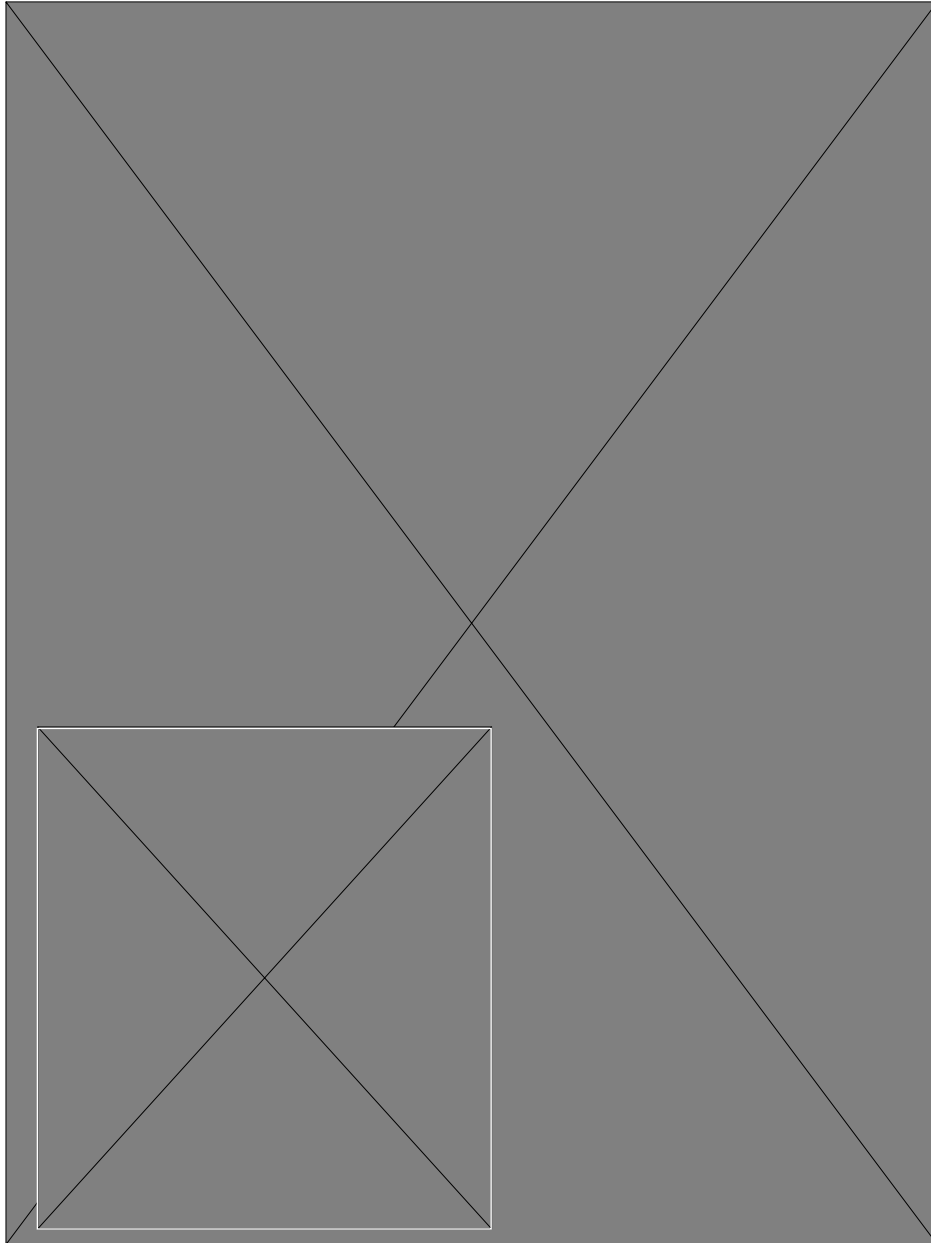


Figure 6. Roelant Savery's white dodo: "Landscape with Orpheus and the animals", painted in Prague around 1611 with (inset) detail of the dodo. Reproduced from Müllenmeister (1988: plate 37), with permission of Staatliche Museen zu Berlin, Preussischer Kulturbesitz.

faces and the colouration of the dodo in Savery's painting closely match Holsteyn's much later version, though Holsteyn took some artistic license in depicting the bill<sup>27</sup> and details of the wing. This white specimen was presumably additional to the blackish one (probably a juvenile) painted at around the same time by Hoefnagel; one of these exhibits no doubt later yielded the extant Prague skull (Wissen, 1995).

#### SAVERY'S DODO IMAGES AND THE ORIGIN OF BONTEKOE'S RÉUNION DODO ENGRAVING

Holsteyn's fanciful wing feathers have been for some a stumbling block to accepting the bird as authentic; for others, evidence of a different (Réunion) species of dodo. However they rather closely resemble the roughly drawn wing on one of the birds in another of Savery's works (Figure 7): a drawing of three dodos preserved in the Crocker Art Gallery, Sacramento, California and rediscovered in 1950 (Eeckhout, 1954; Friedmann, 1956; Ziswiler, 1996).<sup>28</sup> As Friedmann (1956) pointed out, the left-hand bird is, mirror-reversed, clearly the basis of the engraving, by Roelant's nephew Salomon, used to illustrate Bontekoe's visit to Réunion (Figure 8); it was also used to depict the Mauritian dodo in various editions of the amplified Dutch version of Pliny's *Natural history*, and Joris Spilbergen's voyages (Oudemans, 1917; Hachisuka, 1953; Wissen, 1995). The right-hand figure was used by Savery's associate Gillis de Hondcoeter as the basis for his dodo in a well-known composition "Perseus and Andromeda" dated 1627, often reproduced (e. g. Broderip, 1853; Hachisuka, 1953; Wissen, 1995; Ziswiler, 1996).<sup>29</sup> It is not known to what extent the Holsteyns were familiar with Savery's work, but copying amongst artists and the use of stock images was common practise at that time, presumably to speed up the output of paintings before there was any kind of mechanical reproduction of colour images.<sup>30</sup>

Roelant Savery went on to include dodos in a further five pictures painted up to and including 1626, using the same stock image, often in the same corner (bottom right-hand) of the composition.<sup>31</sup> The only major difference is that the overall colour was changed from white to grey, and the wing from yellow to whitish, presumably as a result of information on the bird's normal appearance gleaned from travellers after he re-visited Holland in 1612–1613 and/or after he returned there in 1616.<sup>32</sup> After 1626, the putative date of the Crocker Gallery sketch, his dodos are more lively, variously positioned and doing different things: standing staring at an eel, scratching its face with its rear towards the viewer, or prancing about. According to a note attached to his pen-sketch of a dodo, Adriaen van der Venne saw a live bird in Amsterdam in 1626 (Millies, 1868; Hachisuka, 1953; Wissen, 1995), though the sketch itself is a classic Savery-style 'stock' dodo. We believe Savery also saw this bird (or birds?) and sketched it for the Crocker Gallery drawing, then used these images as the basis for dodos in his later paintings.<sup>33</sup>

Subsequent illustrations of dodos, from Piso's 1658 edition of Bontius' encyclopaedia onwards (Strickland and Melville, 1848), almost all derive from Savery's stock image.<sup>34</sup> Apart from the Hoefnagel, the only independent illustrations, all also early, are those of Clusius in 1605, Van Warwyck's expedition of 1598, the *Gelderland* sketches of 1602, van den Broecke of 1617 (published 1646), Saftleven's head (c. 1638) and Mansur's wonderful painting (c. 1624) done from a live bird brought from Mauritius to Surat in India (all illustrated in Ziswiler, 1996; see also Hume, 2003).<sup>35</sup> The aquarelle sketch by Cornelisz Saftleven (1607–1681) was claimed as a white dodo by Oudemans (1917, 1918) and Renshaw (1938).<sup>36</sup> However the

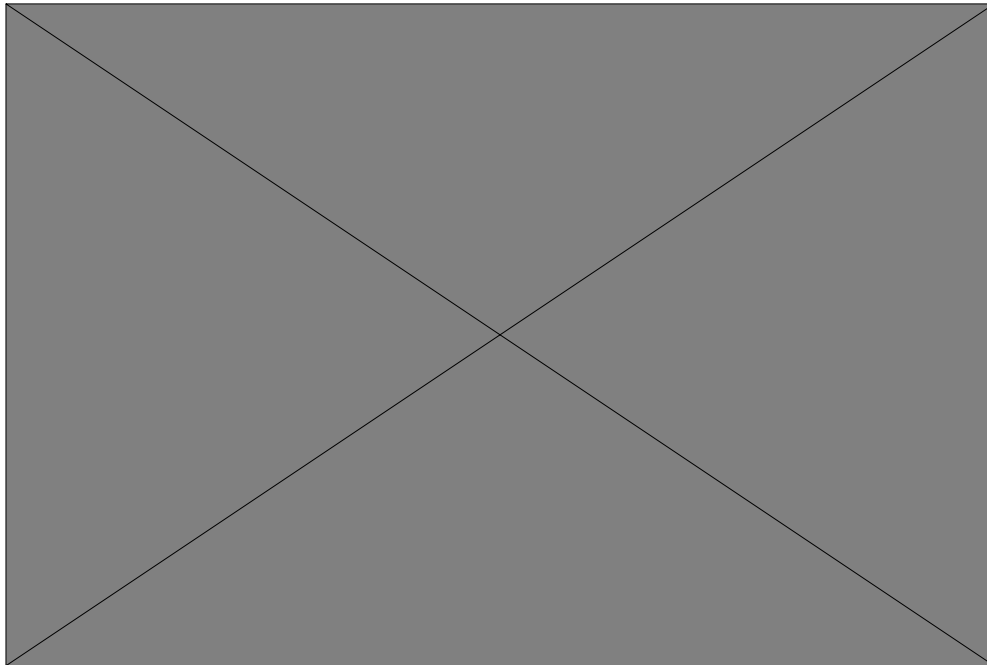


Figure 7. Roelant Savery's sketch of three dodos (from Ziswiler, 1996: 48). © The Natural History Museum, London; reproduced by permission.

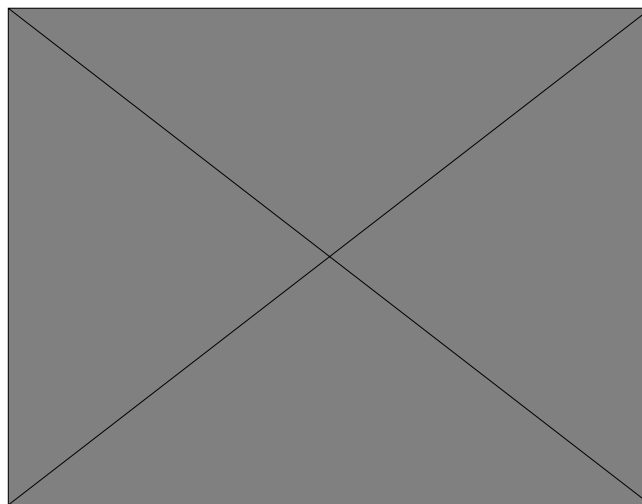


Figure 8. Engraving by Salomon Savery used to illustrate Bontekoe (1646). This image appears in only one version of Bontekoe's travels (Zaagman [c. 1647–1648]: 5). © The Natural History Museum, London; reproduced by permission.

head and neck are dark, and the pale shoulders are simply so because the artist left them in outline. This rather lively bird (illustrated in Fuller, 1987, 2001, 2002; Ziswiler, 1996) may have been painted from life – one indication is the lack of conspicuous nostrils. Comparing images of stuffed birds (Savery's 'stock' dodo, Hoefnagel's painting) and the extant head in Oxford with live or freshly dead ones (the Gelderland sketches, Mansur's painting and the Crocker Gallery drawing), it appears that the large nostrils were inconspicuous slits in life, but that once dried, the skin contracted to create a large gaping orifice.

Apart from the single Prague specimen depicted in Savery's 1611 painting and listed in the inventory of the imperial collection, all coloured images of dodos from life or specimens are grey (later Savery, Saftleven) or blackish (Hoefnagel, Mansur), and all written descriptions the same (Hachisuka, 1953; Wissen, 1995; Ziswiler, 1996). The whitish bird must therefore have been an anomalous, albinistic specimen, and may have been singled out by its collector for that reason. Had the dodo been a familiar bird, paintings of an albino would have rapidly been recognised as such, but it is perhaps understandable that, given the accounts of large white birds in Réunion, and the existence of the paintings of white dodos, the two should have been merged to create a chimera that is found in almost every book on extinctions. However had Strickland still been alive when the Dutch paintings emerged, we have no doubt a more critical view would have prevailed, and a great deal of spurious speculation would have been avoided.<sup>37</sup>

#### A GEOLOGICAL IMPEDIMENT

Finally there are sound geological reasons for believing that no dodo could have reached Réunion. Mauritius (Saddul, 1995) and Rodrigues (Giorgi and Borchiellini, 1998) are volcanic islands eight to ten million years old, whereas Réunion is at most three million years old (Montaggioni and Nativel, 1988). After five or more million years of evolution on the two older islands, it is unlikely that either the dodo or the Rodrigues solitaire would have been capable of flying to the newly emergent Réunion once it became habitable. Much of Réunion's fauna and flora derive from the pre-existing biota of Mauritius, at 164 kilometres to the northeast by far the nearest land, but it completely lacked the flightless or near-flightless birds common to the other two islands: dodos and solitaires, large rails *Aphanapteryx* and *Erythromachus* and large parrots *Lophopsittacus* and *Necropsittacus*.<sup>38</sup> Only animals still able to fly well (other birds, bats), or to survive the sea crossing by current drift (tortoises, lizards and snails on logs), were able to colonise.<sup>39</sup> Among plants it can be seen that in many genera (especially in *Arecaceae* (palms), *Pandanaceae* (screw-pines), *Myrtaceae*, *Sapotaceae*, *Ebenaceae*) there has been substantial radiation in Mauritius, whereas there are only one or two species in those genera in Réunion.<sup>40</sup>

#### CONCLUSION

We concur with Mourer (1995a, 1995b, 1999) that travellers' accounts of large white quasi-flightless birds in seventeenth- and early eighteenth-century Réunion are best referred to the extinct form of sacred ibis discovered sub-fossil in 1974 (Mourer and Moutou, 1987). The enigmatic paintings by Holsteyn and Withoos, depicting dodos with white plumage and yellow wings, can now be traced to a single original by Roelant Savery, painted around 1611 in

Prague. This image was based on a whitish stuffed specimen, originating in Mauritius, then included in Emperor Rudolph II's Kunsthammer (collection of curiosities) (Bauer and Haupt, 1976; Müllenmeister, 1988; Wissen, 1995). This bird, presumably albinistic and possibly collected for that reason, seems to have been unique; all other reported dodos were grey to blackish in colour, often with whitish primary feathers in the wing. There never was a white dodo on Réunion, and it is likely that dodos in Mauritius had already lost the power of flight before neighbouring Réunion emerged from the seabed.

#### POSTSCRIPT

After this paper was submitted for publication, two books about the dodo with pertinent material were published (Hengst, 2003; Pinto-Correia, 2003); neither alters the principal argument and conclusions we offer, but some side issues require comment. Hengst concentrated on dodo iconography; Pinto-Correia's book, only sparsely illustrated, has a chapter on Savery's life and dodo sources. We have also come across another paper drawing attention to Savery's white dodo (Valledor de Lozoya, 2002); the author's conclusions are similar to those presented here – that Savery's bird was an albinistic Mauritian dodo. However Valledor de Lozoya discussed the supposed Réunion white dodo in much less detail (while agreeing that it arose from over-enthusiastic nineteenth century “dodophily”), and he did not directly connect the Savery image with the later Holsteyn and Withoos paintings.

The paintings reproduced by Hengst include, in colour, the Berlin “Orpheus” (**M204**) (Hengst, 2003: 57), principal subject of this paper, and also, in monochrome, the Christies/Salle Leys canvas<sup>33</sup> (Hengst, 2003: 64) and another similar one, “Landscape with exotic birds” (Hengst, 2003: 64), with only a single dodo which is a version of the left-hand bird in the Crocker Gallery sketch (Figure 7). This second painting, not previously reproduced, was sold by S. Nystad of Lochem in 1959; its present whereabouts is unknown. It can now be seen that it, not the Christies/Salle Leys painting, was the model for Hartlaub's (1877) frontispiece, and it is thus the ‘lost’ Seiffer painting, and almost certainly Müllenmeister's (1988) equally ‘lost’ **M157** (“Waterbirds and a dodo by a small waterfall”). The Christies/Salle Leys picture, with a much larger waterfall and an apparently coastal rocky landscape, glossed “Landscape with exotic birds and three dodo's [*sic*]” by Hengst (2003: 64), is likely to be the painting called “Waterbirds by a rocky coast” listed by Müllenmeister (1988: 130) as containing a dodo, but excluded from his catalogue as being partly painted by Savery's nephew Hans (= Jan). Hans Savery is accepted as the painter of a large dodo image kept by Oxford University's Museum of Natural History (Wissen, 1995: cover). Hengst (2003: 60–61) also reproduced the Reims “Noah” (**M250**) in colour.

While Pinto-Correia (2003) promotes the Réunion white dodo as real, Hengst shares our opinion that the Holsteyn and Withoos white dodos have no link to Réunion, though he, like Valledor de Lozoya, did not make the connection with Savery's white Mauritian dodo in the Berlin “Orpheus”. Both authors, however, followed Spicer<sup>41</sup> in dating the Crocker Gallery sketch not to *circa* 1626 but to Savery's time in Prague (pre-1613), though they differed on whether the dodo was alive or dead when the sketch was made. If correct, this early date would make it difficult to explain the transition from the ‘stock’ dodos of his earlier paintings to the lively ones of his later years. Pinto-Correia (2003) emphasized Savery's frequent re-use of the same images in paintings throughout his career, but failed to explain the different dodo styles and even claimed that the fat, static ‘stock’ dodo was derived from

the Crocker sketch. Müllenmeister (1985: 202) also hinted that he favoured the earlier date for the sketch, but there is nothing substantive to go on (Friedmann, 1956; Besselink, 1995). The sketch is uniform in style with others, equally undated, depicting elephants (Eeckhout, 1954; Pinto-Correia, 2003) and eagles (Müllenmeister, 1985), which Spicer<sup>41</sup>, Hengst (2003) and Pinto-Correia (2003) argued must have been done in the Emperor's Prague menagerie or his museum rather than in Holland where the range of animals was poorer. Unknown to Müllenmeister (1985) and Pinto-Correia (2003), Spicer (1984) later decided the drawings were not done in Prague, but between 1616 and 1626 in Holland. To us, and to Friedmann (1956), Besselink (1995) and Pinto-Correia (*contra* Hengst), the lively birds in the sketch imply a living model. If Savery had seen and sketched living dodos in Prague, we would expect him to have used those sketches in his paintings from then onwards, not waited for 14 years, coincident with the known presence of a live dodo in Amsterdam, before branching out with the different postures and feathering. There is no equivalent change in the depiction of other exotic species in his late paintings, which implies to us that there was new input specifically related to dodos. Hengst (2003), however (*contra* Müllenmeister, 1988; Pinto-Correia, 2003, and this paper), dated *all* Savery's dodo paintings to the period 1626–1628, and attributed the palor of the Berlin "Orpheus" dodo to Savery's distribution of highlights in this particular work. Valledor de Lozoya (2002), who has examined the original painting, pointed out that it is apparently dated by Savery himself to 1611 though the date is hard to read. He was inclined to prefer Müllenmeister's (1988) alternative dates of 1628 or 1631 on stylistic grounds, but conceded<sup>42</sup> that there is another other similar Savery "Orpheus" landscape with animals of an equally early date (1610, now in Frankfurt, **M 203**). Even if the Berlin "Orpheus" was proved to date from the late 1620s, it nevertheless precedes the Holsteyn and Withoos white dodos by several decades, and our principal argument stands.

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## NOTES

<sup>1</sup> "Daer waren oock eenige dod-eersen, die kleyn vlegels hadden, maer konden niet vliegen, waren soo vet datse quallijck gaen konden, want als sie liepen, sleepte haer de neers langhs de aerde." The exact date of Bontekoe's visit is not recorded in his book, except that it was between 31 May (when he passed the Cape) and 19 November



(when he reached the Sunda Straits). P. Brial (to J. P. Hume, *in litt.*, 28 October 2001), taking journey times into account, suggested the visit was in August. As discussed (see p. 000) one early edition of Bontekoe's travels (see Figure 8) was illustrated with a dodo engraving derived from a Mauritian bird. Given that the Dutchman was later shipwrecked and lost all his personal effects, and did not get back to Holland for seven years, he must have written up his visit to Réunion from memory. It is quite likely that, having seen large quasi-flightless birds there, he embellished their description from published accounts of dodos from Mauritius. The only previous Dutch visitor, Adriaen Blok in 1612, made no mention of such birds (Brial, 2001).

<sup>2</sup> The fullest description was from Dubois (1674), englished by Oliver (1897) as follows:

Solitaires. These birds are thus named because they always go alone. They are as big as a big Goose, and have white plumage, black at the extremity of the wings and of the tail. At the tail there are some feathers resembling those of the Ostrich. They have the neck long, and the beak formed like that of Woodcocks ["bécasses"], but larger; the legs and feet like those of turkey-chicks ["poulets d'Inde"]. This bird betakes itself to running, only flying but very little.

The last sentence is wrongly translated, the original reads "cet oiseau se prend à la course", meaning "this bird is taken [i.e. captured] by running after it" (as in hare-coursing). Dubois' "bécasse" has always been translated into English as woodcock (*Scolopax rusticola*), but oystercatcher ("becasse de mer", *Haematopus ostralegus*) is an equally probable gloss; both birds have long straight bills, but the oystercatcher's is more robust.

Two accounts, Ruelle's and the log of the *Navarre*, referred to "lourdes" (Lougnon, 1970; Cheke, 1987; P. Brial to J. P. Hume, *in litt.*, 28 October 2001), both in lists in which solitaires do not feature, so this may have been another term for the same bird. Hébert (1999), however, argued that Ruelle intended "palombes" (pigeons), and that a copyist unfamiliar with the word had rendered this "palourdes".

<sup>3</sup> Our translation. The solitaire supposed to have been sent to France from Réunion by Mahé de Labourdonnais around 1640 (Billiard, 1822) would have been a Rodrigues solitaire (*Pezophaps solitaria*); the Réunion bird was by then extinct (see Cheke, 1987). P. Brial (to J. P. Hume, *in litt.*, 28 October 2001) considered this story of Billiard's doubtful, as there is no independent corroboration.

<sup>4</sup> Duquesne's (1689) tract contains a description of Réunion (the putative "île d'Eden"), which was plagiarised directly from Dubois (1674), mildly paraphrased. It has been reprinted many times, most recently by Racault and Carile (1995) (see also North-Coombes, 1991). Leguat's book is dated 1708, but Racault (1995) has established that it was released in October 1707.

The plan for a Huguenot colony on Réunion failed because, contrary to what Duquesne believed, the French Compagnie des Indes still had a settlement there, so Leguat and his companions were instead deposited on Rodrigues, an archetypal desert (i. e. uninhabited) island. His subsequent account was for long taken by literary historians (though not naturalists) to be fiction (e. g. Atkinson, 1922), but is now well-established through much independent evidence as a factual account (North-Coombes, 1991; Racault, 1995).

<sup>5</sup> Our translation; the original reads: "Le dronte parait propre et particulier aux îles de France et de Bourbon, et probablement aux terres de ce continent qui en sont les moins éloignées; mais je ne sache pas qu'aucun voyageur ait dit l'avoir vu ailleurs que dans ces deux îles."

<sup>6</sup> Buffon was widely read, but his sources were patchy, and crucially (and unexpectedly) he appears to have overlooked most of the French literature on Réunion from the seventeenth century, apart from Carré and Flacourt (Buffon, 1770–1783); the latter did not mention large quasi-flightless birds in his description of Réunion (Flacourt, 1661) (see Lougnon, 1970).

<sup>7</sup> Lamouroux (1824: 2: 29), editing a reprint of Buffon's works, wrote in a footnote to Buffon's dodo article: "Cuvier and other naturalists regard the existence of this bird as very doubtful" (our translation); this was before Mauritian naturalist Julien Desjardins had sent Cuvier Rodrigues solitaire bones (Strickland and Melville, 1848). Strickland (Strickland and Melville, 1848: 4–5), mentioning no names, wrote:

so rapid and so complete was their extinction that the vague descriptions given of them by early navigators were long regarded as fabulous or exaggerated, and these birds, almost contemporaries of our great-grandfathers, became associated in the minds of many persons with the Griffin and the Phoenix of mythological antiquity.

Réné-Primevère Lesson was the principal detractor, trying to refute Duncan's (1828) article (Hachisuka, 1953), even though Duncan had a head and foot in the Ashmolean Museum, Oxford.

<sup>8</sup> *Apterornis* was pre-occupied, so Schlegel's generic name *Ornithoptera* was subsequently used (see discussion in Hachisuka, 1953).

<sup>9</sup> Newton backtracked later. In *Dictionary of birds* (Newton and Gadow, 1896: 217), he wrote that "though two figures — one by Bontekoe (*circa* 1670 and another by Pierre Withoos (ob. 1693) have been thought to represent

it (Trans. Zool. Soc. vi p. 373 pl. 62 [Newton, 1867]) their identification is but conjectural. Yet the existence of the bird is undubitable”.

<sup>10</sup> Newton (1867: 375) suggested that the rather blunt bill in the Withoos painting was evidence of a living captive bird being the model:

The beak of the Dodo, as represented here, also demands a word of comment; instead of terminating in the formidable dertrum to which we are accustomed in the pictures of the Saverys and Goemare, its tip is rounded off, as if it had undergone the operation known among falconers as ‘coping’. Now I cannot help thinking that in this point we have grounds for believing that the subject of the Figure must have been a bird kept in captivity. The Dodo was no doubt able with its powerfully hooked beak to inflict very serious injury; and it is not improbable (so it seems to me) that the keeper of such a bird would consult his own safety, and, by trimming an offensive weapon so likely to be used against him, deprive it of the means of doing harm.

<sup>11</sup> At the time of Coker’s discovery, John Gould, sometime Curator of birds in the museum of the Zoological Society of London (Wheeler, 1997) was a world-famous ornithologist, and by 1866 Alfred Newton was Professor of Zoology and Comparative Anatomy at Cambridge University (Wollaston, 1921). Their views thus carried considerable weight.

<sup>12</sup> The Holsteyn white dodo in the Teyler’s Museum is not recorded before 1865, when J. L. van der Burch of Haarlemliede (or Spaarnwoude) gave it to A. van der Willigen Pz. of Haarlem. It was exhibited with other sketches at the Academy of Haarlem in December 1865 (Millies, 1868; Renshaw, 1938; see also review of Millies’s paper (Anonymous, 1868, presumably by the editor, A. Newton). Miss C. A. van Willigen (the daughter ?) presented it to the museum in 1916 (Plomp, 1997). The London version first appeared in an Amsterdam sale in 1908 (Plomp, 1997) when it was bought by Dr Hans Wertheim and sold on to the British Museum (Natural History), London, in 1937 (details in the archives of The Natural History Museum, London (anonymous contemporary typescript, in the folder kept with the painting in The Natural History Museum, London, reference 88 O H); the acquisition was noted by Kinnear (1937), Renshaw (1938) and Hachisuka (1953)). The third picture was owned by Baron van der Feltz when Oudemans (1917) illustrated it, but is now missing; Plomp (1997) was unable to discover its whereabouts. According to Jackson (1999) it is in the Rijksmuseum, Amsterdam, though this appears to be an error (M. Besselink to J. P. Hume, pers. comm., 11 February 2002).

<sup>13</sup> The younger Pieter Holsteyn was a student of his father, a well-established glass painter and engraver; both were prolific, based in Haarlem; the son also worked in Zwolle and Munster (Jackson, 1999; Dumas and Rijdt, 1994). They probably both used the initials “PH” and many works cannot be assigned with certainty to one or the other (Plomp, 1997).

<sup>14</sup> According to manuscript letters in the archives of The Natural History Museum, London (BMNH 1357/18), the Withoos dodo is known to have been in the Dare family from at least the 1850s, but its earlier history is not known. After Mr C. Dare’s death in June 1918, his son Walter C. Dare offered it (and another Withoos of wildfowl without a dodo) to the British Museum (Natural History). An internal memorandum from S. F. Harmer to C. E. Fagan (20 June 1918; BMNH 1357/18) suggested that its purchase would not be a priority for the museum, and that perhaps Lord Rothschild would be interested, Fagan answering that he agreed that it should not be bought, and asking Harmer to reply. Things moved quickly: a typed footnote on the original letter from W. C. Dare reads “This picture was purchased by Lord Rothschild for his museum at Tring, June 28th, 1918” (BMNH 1357/18).

<sup>15</sup> M. Besselink to J. P. Hume, pers. comm., 11 February 2002. Marijke Besselink is a curator at the Teyler’s Museum, Haarlem, where one of the Holsteyn white dodos is kept. Rothschild was sometimes careless with detail, and gave no source for his claim about the Withoos; he may have been referring to a Holsteyn image. See Cheke (1987: 34, 44, 47–49) for errors or extravagant claims pertaining to extinct Mascarene birds in Rothschild (1907).

<sup>16</sup> Dubois (1674) expressly stated that the solitaire did not have a fat cycle: “All the birds of this island have their season at different times, being six months in the flat country and six months in the mountains, from whence returning they are very fat and good to eat. I except the birds of the river and the Solitaires, the partridges [“perdrix”; *Turnix nigricollis*] and the Blue-Birds [“oiseaux bleus”], which do not change” (translation by Oliver, 1897).

<sup>17</sup> Hoefnagel’s paintings of a Mauritian dodo and a red hen (*Aphanapteryx bonasia*) are the oldest full-colour pictures of these extinct species. They were painted around 1610, using stuffed specimens of birds that had lived in the Emperor Rudolf II’s menagerie at Ebersdorf. Although often attributed to Georg (Joris) Hoefnagel, he died in 1600 before any dodos could have reached Prague. According to Jackson (1999) the paintings were done by his son Jakob, who was paid to paint the emperor’s collection in 1610.

<sup>18</sup> This painting, owned by the Duke of Northumberland, and formerly exhibited at Syon House near London (Broderip, 1853), is now attributed to Gillis de Hondcoeter (Ziswiler, 1996; Jackson, 1999) on the basis of a

monogram previously misinterpreted (Geeraerts, 1982); it is now in Alnwick Castle (Ziswiler, 1996).

<sup>19</sup> No bird remains were located in Réunion before 1974. The skull in Prague is from a Mauritian dodo (Strickland and Melville, 1848; Wissen, 1995), possibly from the bird painted by Hoefnagel (see note 17). The skeletons in Cambridge, still exhibited in the public gallery, are of a Mauritian dodo and a Rodrigues solitaire, reconstructed from sub-fossil remains (personal observation by JPH and ASC, November 2000).

<sup>20</sup> Marquis Masauji Hachisuka was a strongly anglophile member of the Japanese aristocracy – but the hypothetical bird was named after King Victor Emmanuel of Italy, not after Queen Victoria (Hachisuka, 1937).

<sup>21</sup> Tatton's account is often referred to as by Castleton. Samuel Castleton was captain of the East Indiaman, the *Pearl*, interloping on the East India Company's claimed monopoly of trade with the Indies (Farrington, 1999). John Tatton, ship's master, wrote the account of the voyage (Purchas, 1905: 3).

<sup>22</sup> Fat cycles are now known to have been a feature of Mascarene wildlife before the advent of man altered the islands' ecology. They occurred in tortoises, flying-foxes, pigeons, parrots and bulbuls (*Hypsipetes* as well as dodos and Rodrigues solitaires (Cheke, 1987). Although Tatton (Purchas, 1905: 3) and Bellanger (Lougnon, 1970) reported Réunion solitaires as fat, Dubois, who was on the island for 16 months, specifically excluded them from his list of birds with a seasonal vertical migration and fat cycle (see note 16).

<sup>23</sup> Although Edward Newton (1888), Alfred's brother, called the Réunion bird *Didus solitarius*, he added a note of caution: "not even a bone of this Dodo, nor any Figure of it which we can with certainty trust, remains to us now, so far as anyone has been able to discover".

<sup>24</sup> Cheke's (1987) discussion of the history of extinct Mascarene birds, had gone to press before the description (Mourer and Moutou, 1987) of this ibis was published. In late 1987, after publication of the ibis diagnosis, Cheke wrote to François Moutou to suggest that he and Cecile Mourer had at last found the enigmatic solitaire.

<sup>25</sup> Number 204 in Müllenmeister's *Oeuvrekatalog* (1988), kept in Staatliche Museen zu Berlin, Preussischer Kulturbesitz. His catalogue numbers will in subsequent notes be designated as **M204**, etc. This painting had long been known, and was included by Biedermann (1898) in his list of dodo paintings (no.10, then in Emden). He even clearly stated that "die Dronte is fast ganz" ("the dodo is almost completely white"). Hachisuka (1953) also listed it, but overlooked its unusual colouration. No reproduction has previously appeared in a natural history publication.

<sup>26</sup> Müllenmeister (1988: 131) noted the connection between the 1611 "Landscape with Orpheus ..." and the entry in the manuscript catalogue of the emperor's collection, but did not comment further as presumably he did not appreciate the significance of the white colour of both the painted bird and the described specimen.

<sup>27</sup> Hosteyn's rounded upper mandible, copied by Withoos, caused Newton (1867) to suggest the original was a captive bird with its bill filed down to prevent damage to its keepers (see note 10 above).

<sup>28</sup> The dodo sketch was purchased by Judge E. B. Crocker and his wife from Rudolf Weigel of Leipzig in the 1870s (Friedmann, 1956). Before that it was in the Rosey collection (Eeckhout, 1954), about which Friedmann was unable to discover any information.

<sup>29</sup> This painting was formerly attributed to Goeimare (full details are in note 18).

<sup>30</sup> Jackson (1993) drew attention in the Vienna "Paradise" (**M155**) to a stylised vulture ("eagle" according to Müllenmeister, 1988) with extended wings, evidently detached from its perch and placed in mid-air in the upper centre of the picture. What she did not report was that this same 'stock' vulture was used in several other paintings, e.g. the Pommersfelden "Orpheus" (**M225**) and the London "Paradise" (**M158**). 'Stock' pelicans, ostriches, cassowaries, crowned cranes and several other species can be traced through Savery's portfolio through the years.

<sup>31</sup> The other early (pre-1626) 'stock' dodos are catalogued by Müllenmeister (1988) as **M225** ("Orpheus": Schloss Weissenstein, Pommersfelden, date in doubt: c. 1615–1628), **M206** ("Orpheus": Mauritshuis, The Hague, 1617), **M250** ("Noah after the flood": Musée des Beaux Arts, Reims, c. 1625), and **M233** ("Paradise": Staatlichen Museen zu Berlin, 1626). There is another in The Natural History Museum, London, using the 'stock' dodo which Müllenmeister did not list, but is generally accepted as by Roelant Savery and well-known as "Edwards' Dodo". The dodo is the centrepiece filling the centre of the picture, surrounded by other birds in a restricted landscape (Ziswiler, 1996: cover; Hachisuka, 1953: frontispiece (from a copy of the Savery by Keulemans)). This image is the most copied version of the bird, and the basis for most familiar versions (e.g. Tenniel's dodo in *Alice in Wonderland* (Carroll, 1866)). A further "Savery", listed by Ziswiler (1996), in The Natural History Museum, London, is a copy (signed "E. M. P. K. 1879") of Strickland and Melville's (1848) frontispiece, which itself is a copy of the dodo and Savery's signature taken from the Berlin "Paradise" (**M233**). The Pommersfelden "Orpheus" (**M225**) is dated variously by Müllenmeister as "before 1615" (1988: 304) and "1628" (1988: 359), and cited by Ziswiler (1996) as "c. 1625"; we think it must pre-date 1626. There is some variation in the dodos in these works. **M206**, **M233** and "Edwards' Dodo" are in exactly the same stiff upright posture and virtually feather-by-feather identical,

while **M250** (Reims) has the same bird (by the feathering) leaning forward peering into a stream. Müllenmeister's original plate (1988) cut the dodo off, but he remedied this in his supplement (Müllenmeister, 1991); the only colour reproduction known to us is a postcard produced by the Reims museum. The Pommersfelden bird (**M225**) is a little less rigid (but still upright) and is shown up to its ankles in water; it is so small that it is not even visible in Müllenmeister's monochrome reproduction, but is well illustrated in colour by Ziswiler (1996). Savery's associate Gillis de Hondecoeter (see Müllenmeister, 1985) also painted two very similar 'stock' dodos. One is in the bottom right-hand corner of "Paradise landscape with animals", illustrated by Müllenmeister (1985, cat. no. 85; cited as being in Müllenmeister's own gallery in Solingen). This painting has not previously been noted in the dodo literature. A different painting, then in Professor J. Stumpf's collection in Berlin, with a similar dodo (but different surroundings) was illustrated (detail only) by Oudemans (1917: plate 5, figure 9); he attributed it, possibly wrongly, to Gillis's son Gijssbert. The one cited by Oudemans was mentioned by Hachisuka (1953) and reproduced in vignette by Ziswiler (1996: 29).

<sup>32</sup> Savery was born 1576 in the Flemish town of Courtrai/Kortrijk, then in the throes of revolt against absentee rule from Spain. Possibly because the southern provinces of The Netherlands (now part of Belgium) reverted to Spanish rule in 1579, the Savery family emigrated to first Haarlem then Amsterdam in the newly independent Dutch Republic. He moved to Prague in the service of Emperor Rudolph II in 1605, remaining until the Emperor's death in 1612. In 1613 he returned briefly to Holland, then travelled doing commissions in Prague, Salzburg and Munich before returning to Holland in 1616. He settled in Utrecht in 1619, where he died in 1639 (Müllenmeister, 1985; Eeckhout, 1954; Spicer, 2000; Moree, 1998).

<sup>33</sup> These later, more lively paintings are Müllenmeister's **M158** ("Landscape with dodo and vulture", Zoological Society, London, c. 1626), **M155** ("Landscape with birds", Kunsthistorisches Museum, Vienna, 1628) and a painting formerly belonging to Dr Otto Seiffer (or Seyffer) in Stuttgart, but lost since it was auctioned after his death in around 1892 (Biedermann, 1898; Hachisuka, 1953). A pencil copy by Theodore Heuglin was however used to engrave the frontispiece and cover of Hartlaub's (1877) book on Madagascar birds, so we know what the dodo was doing – it was an enhanced version of the left-hand bird in the Crocker Gallery drawing (Friedmann, 1956). The Zoological Society's "Landscape with dodo ..." (**M158**) has a re-worked version of the tiny central bird in the Crocker drawing, the most lively of all Savery's dodos. The Vienna "Landscape with birds" (**M155**) has a unique pose; the dodo is shown looking down into water, quite differently feathered from the 'stock' birds of Savery's earlier period.

Finally a Savery painting with three dodos in it based on the Crocker drawing, "property of a noblewoman", which was sold by Christie's in London during November 1979 (Christie's, 1979; Geeraerts, 1982). This picture was sold on again at Salle Leys in Antwerp in 1983 (Anonymous, 1986: colour illustration). Two of the dodos are in the right foreground, one in front of the other, so the rear dodo's feet are hidden by the one in front. The front dodo is a direct copy of the right-hand bird in the Crocker drawing, while the one behind looks like the Hartlaub version of the bird from the lost Seiffer picture. The copy however has feet, whereas they cannot be seen in the Christie's/Salle Leys painting – they could no doubt have been supplied by the copyist using the front bird. The third dodo is half-hidden in the woods, top left, rear on, as in the centre bird in the Crocker sketch. It appears from its composition that, despite having three dodos, this picture is "Waterbirds and a dodo by a small waterfall" (**M157**), listed as missing by Müllenmeister (1988), and is probably also the lost Seiffer painting. It was bought in 1979 using a suspected pseudonym (F. Russell to A. S. Cheke, *in litt.*, 4 March 2002), and after resale in 1983 its current owner and whereabouts are not known (Anonymous, 1986). This painting was also reproduced by Fuller (2002).

<sup>34</sup> Hachisuka (1953) presented a series of pictures discovered by Killerman and Casey Wood, unconnected with Savery, which (following Oudemans, 1917) he associated with his Réunion solitaire. Although all are similar, none can with certainty be assigned to any known bird, nor have they any recorded geographical associations. One, dated 1657, by Johann Walther (Albertina Collection, Vienna) seems to us to be a mirror-reversed copy of a better-known "dodo" by Jan van Kessel, part of his "Continent of America" tableau (illustrated in Jackson, 1993: 94–95). Hachisuka (1953) listed the Kessel under Mauritian dodo pictures, but cautiously suggested it might be a Réunion solitaire. Friedmann (1956) reported another Kessel dodo in the Prado, Madrid, but this one is a bizarrely coloured version of van den Broecke's engraving (illustrated in Ziswiler, 1996: 33). Kessel "sometimes let his imagination take over from reality" (Jackson, 1993: 98) and we are not convinced the bird in "Continent of America" is a dodo/solitaire at all.

<sup>35</sup> Some of these also have derivatives. Hoefnagel's bird was incorporated by Jan Breughel the elder into his "Allegory of Air" of 1611 (see Jackson, 1993; Ziswiler, 1996), and several of Thomas Herbert's illustrations concerning Mauritius for his famous travels (Herbert, 1634), including the dodo, were crudely plagiarised from an engraving in the "Tweede boek", or journal of van Neck and van Warwijck's expedition of 1598 (reproduced in Strickland and Melville, 1848: plate 2; Wissen, 1995: 16; Ziswiler, 1996: 7). The mid-eighteenth century artist Aert

Schouman appears to us to have based the head of his dodo (illustrated in Friedmann, 1956: plate 5) on Saftleven's head, though Friedmann thought a painting by Kessel was the model.

<sup>36</sup> Schultz (1978) is a standard guide to Saftleven's life and work.

<sup>37</sup> Strickland died in 1853, hit by a train while examining a geological exposure in a railway cutting (Baker and Bayliss, 2002).

<sup>38</sup> Réunion also has far fewer lizards than Mauritius (Arnold, 2000), and lacks snakes, the endemic Mauritian boas (Bolyeridae) having also been unable to make the crossing.

<sup>39</sup> STRAHM, W., 1993 The conservation and restoration of the flora of Mauritius and Rodrigues. Unpublished doctoral thesis, University of Reading.

<sup>40</sup> The biogeography of the Mascarene vertebrate fauna will be discussed in detail in a forthcoming book by the present authors.

<sup>41</sup> SPICER, J., 1979. *The drawings of Roelandt Savery*. Unpublished doctoral dissertation, Yale University, New Haven, Connecticut, USA.

<sup>42</sup> A. Valledor de Lozoya to A. S. Cheke, pers. comm., 19 August 2003.

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