

Review

The Dodo and the Red Hen, A Saga of Extinction, Misunderstanding, and Name Transfer: A Review

Anthony S. Cheke ^{1,*} and Jolyon C. Parish ²

¹ 139 Hurst St., Oxford OX4 1HE, UK

² Ty Graig, Aberbanc, Llandysul, Ceredigion, Wales SA44 5NP, UK; jolyon_parish@yahoo.co.uk

* Correspondence: anthony.cheke@dodobooks.com

Received: 20 November 2019; Accepted: 14 January 2020; Published: 18 February 2020



Abstract: The chronology of observations of two extinct flightless birds in 17th century Mauritius, the dodo (*Raphus cucullatus*) and the red hen (*Aphanapteryx bonasia*), and what names or descriptions were used for them, is re-examined. It was concluded that the balance of probabilities is strongly against birds called *dodaarsen* without descriptions in the 1680s being dodos rather than red hens. The dodo had disappeared earlier due to predation by pigs, but a hiatus in settlement broke observational continuity, yet folklore preserved the name and transferred it to the red hen. The dodo's extinction thus happened unobserved.

Keywords: *Raphus cucullatus*; *Aphanapteryx bonasia*; Mauritius; 17th century; Dutch; pigs

1. Introduction

The arrival of humans has always had a devastating effect on island biotas [1], most disastrously on vicariant fragments of ancient Gondwanaland (New Zealand, Madagascar) and oceanic islands [2]. While some places, such as Australia, have been subject to human influence and extinctions over tens of millennia [3], others were discovered and colonised so recently that the entire impact on the island has been chronicled. One such group is the Mascarene Islands (Mauritius, Réunion, and Rodrigues), far out in the Indian Ocean, east of Madagascar. Discovered in the early 1500s and first described in 1598, Mauritius was the first of the trio to be visited and settled, and successive occupiers (Dutch, French, British) and miscellaneous visitors have left detailed accounts that can be assembled into a history of impact over centuries [4].

During early visits and the first settlement period in the 17th century, the direct ecological impact of humans in Mauritius was relatively low, but important changes were happening under the radar from the suite of invasive animals that the Europeans introduced [4]. Black rats (*Rattus rattus*) had previously from shipwrecks, but the Dutch released monkeys (*Macaca fascicularis*; probably unwanted pets) and ungulates (goats, cattle, deer, pigs) to provide food for later visits and future settlement [4]. One of the first species to be impacted was the endemic dodo (*Raphus cucullatus*), a large flightless pigeon whose story illustrates both the rapid effects of invasive predators and the contemporary failure to perceive their impact, followed by slow realisation by 18th century European settlers of the changes that they were imposing on these new environments.

2. Background

When dodos were first discovered by the Dutch, they were an object of wonder. They were described in travel books; a few specimens were brought alive to Europe by Dutch and English mariners, and even taken to India to be presented to the Mogul emperor Jahangir [4–6]. As the largest land animal on the island apart from giant tortoises (*Cylindraspis* spp.), they were also readily eaten by sailors in need of fresh meat [7]. However, once the ungulates had spread and multiplied, dodos

faded from view as the Dutch, who established a settlement in 1638 [8], turned to bigger game to hunt. Meanwhile the dodos faded as the abundant and omnivorous feral pigs took their toll [4]. This is when human perception, folk memory, and ecological reality become confused.

3. Extinction-Date Controversy

The dodo has long been recognised as an icon of extinction [9,10], but the date of that extinction remains in contention. The argument revolves around the interpretation of birds reported as *dodaarsen* (“dodos”) in the 1680s—were they dodos, or had the name definitively transferred from the by-then extinct dodo to the other then still surviving flightless species, the red hen or red rail (*Aphanapteryx bonasia*)? As assertions of the validity of the 1680s *dodaarsen* (“dodos”) continue to be published [11] (p. 31), this paper sets out the available data in full to clarify where the weight of evidence actually lies.

Until one of us reassessed the evidence in the 1980s [12], the last report of the dodo had been widely taken as Benjamin Harry’s report of “Dodods, whose flesh is very hard” in 1681 [13,14]. However, as early as the 1860s, Alfred Newton [15] had noted the name transfer that led Johann Hoffmann in the 1670s to use a dodo name for the red hen [16,17] and, after finding a second example of the same phenomenon, ASC [12] thought it likely that the 1681 account also probably referred to the red hen. This then left *Arnhem* shipwreck survivor Volkert Evertsz’s dodo on an offshore islet in 1662 as the last record [18,19]. This interpretation was generally accepted [20] until the discovery in the 1990s, in Isaac Lamotius’ journals, of the mention of *dodaarsen* caught by hunters during 1685–1688, first reported by Moree [21] and enumerated more fully (20 birds on seven occasions) by Hengst [22] and Parish [6]. Sleight [23], who worked in the Cape Archives, claimed over 50 such “dodos” were reported, but concentrating on other matters, he did not transcribe the dates and details (letter from Dan Sleight to JCP 23.7.2009); Janoo’s claim [24] that Moree [21] “found written proof of dodos being alive west of Mahébourg in 1689” is not borne out by Moree’s text—the remark was in an online article that is no longer available (see Supplementary Materials S1: note 1); “1689” may have been an error for 1688. However, the “late-date” controversy only really erupted after the publication of an additional late claim (from Hubert Hugo in 1673) by Hume et al. [25].

The heart of the problem is that the *dodaarsen* in the Lamotius journals reported in 1685–1688 and Hugo’s bird in 1673 are not described. The argument in favour of their being actual dodos is that these two, both *opperhoofden* (commanders) of the small Dutch settlement in Mauritius, were educated men and would have known a dodo from a red hen, and that Lamotius in particular was a keen observer of nature [11,22,25]. Lamotius was interested in medicinal plants, timber trees, and especially marine fish, carefully painting many varieties (published in [26]), but there is no evidence in his dispatches that he was interested in terrestrial wildlife other than as food ([14,27] and references therein [28]) (see Supplementary Materials S1: note 2). Hugo certainly knew about real dodos, as is clear from his interrogation of a recaptured slave on the run for 11–12 years [28,29], but the evidence is that he realised his earlier reference to a *dodaers* was an error (see below); the spellings “*dodaers*” and “*dodaars*” were used interchangeably by Dutch visitors and settlers. Hengst [22] advanced a further argument for the late *dodaarsen* being dodos: the hunters only mentioned large animals, and they would not have bothered with red hens, as they were too small. Against this purely speculative view, one might note that, as already pointed out [29], hunters were using dogs that would catch flightless but not flighted birds, so might well catch the rails that would then get enumerated, even if they were of little more than snack value to the colonists.

The post-1662 date has also been supported by using statistical methods that analyse observation sequences to predict likely extinction dates [30,31]. Results are highly dependent on which dates are chosen for the calculation [6,27] and whether the offshore islet birds in 1662 are treated as part of a mainland continuum [29]. The methods are useful indicators when other indications are not available, but in the case of the dodo, statistical inferences are outweighed by other evidence [30]. Finally, a poorly defined bird in a 17th century Dutch sketch attributed to Lamotius in 1677 was claimed by Grove [32] to be that of a dodo, but on further study, the drawing proved to actually date from 1670 (pre-Lamotius), and the bird to almost certainly be endemic sheldgoose *Alopochen mauritianus* [6,33].

The earlier extinction date is supported by reports by Dutch settlers that abundant feral pigs, originally introduced in 1606 [4], sought out and ate tortoise and turtle eggs [28,34] (see Supplementary Materials S1: note 3); thus, it can be inferred that they would likewise eat ground-nesting-bird eggs [4,35–37]. In the Galapagos, feral pigs are prime predators on giant-tortoise eggs and hatchlings [38,39]. Dodo nests, as reported by Cauche [40], and like those of the related Rodrigues Solitaire [41], were not concealed, whereas those of the red hen, if like those of its Rodrigues sister species *Erythromachus leguati*, would have been very hard to find. In two years on Rodrigues, 1691–1693, François Leguat [41] and his companions never found a nest. *Aphanapteryx*, like most rails [42] (Appendix A), probably had a larger clutch size than the dodo (one egg: [40]); dodo eggs, being larger, would have taken longer to incubate and would have thus been vulnerable for a longer period than those of the smaller rails. Macfarland et al. [38] noted that the long incubation period of tortoises increased their vulnerability to pigs. Hence, it is likely that dodos were decreasingly able to successfully once pigs had overrun the island in the 1620s [12], whereas, still breeding well, the rails could even have benefitted in foraging from the pigs' digging, scraping, and rooting, as does the New Zealand weka (*Gallirallus australis*), a flightless rail of similar size to *Aphanapteryx* [42].

4. Name Transfer

The key to the interpretation lies in the account of Johan Hoffmann and a more recently discovered earlier account by Johannes Pretorius [43]. Both lived on the island for two to three years and left rather complete faunal lists. Pretorius (on the island 1666–1669) was effectively second-in-command (and considered for commander [43]); almost a decade later, Hoffmann (1673–1675) was the community's spiritual preacher or pastor on the island. Both were therefore fully embedded in the settlement's activities, would have known all the inhabitants, and been familiar with hunting activities and what the local animals were called. Hoffmann [44] published a book of his travels, but Pretorius's manuscript memoir only recently surfaced. A further faunal account in 1666 by a contemporary of Pretorius, Jacob Granaet, mentions no flightless birds [14,43].

Given their long involvement in the community, one must assume that Pretorius and Hoffmann's faunal nomenclature matched what was in general use at the time, and indeed, for all but one species, their usage is unexceptional—pigeons, parrots, geese, ducks, bats, tortoises, and domestic livestock carried their usual names, as did the “Indian ravens”, the long-standing Dutch name for the large semiflightless parrots *Lophopsittacus mauritianus*, long since extinct [4,43]. The one exception is that both writers' cases described as *dodaers*/toddärsche birds that are clearly, from their descriptions, the red hen:

The *dodaers* is a red bird, as big as a fowl, has short wings and cannot fly. It scratches in the earth with its sharp claws like a fowl to find food such as worms under the fallen leaves. This bird is unbelievably stupid. When one waves a stocking cap and makes a sharp sound with the mouth, it immediately heads towards that person, and if one carries a stick, all of them can be killed with it without any escaping. They are fatty and greasy to eat. They have a long, sharp beak which is slightly curved at the end. (Pretorius [43]).

[there is also] a particular sort of bird known as *toddärschen*, which is the size of an ordinary hen. [To catch them] you take a small stick in the right hand and wrap the left hand in a red rag, showing this to the birds, which are generally in big flocks; these stupid animals precipitate themselves almost without hesitation on the rag. I cannot truly say whether it is through hate or love of this colour. Once they are close enough, you can hit them with the stick, and then have only to pick them up. Once you have taken one and are holding it in your hand, all the others come running up as if to its aid and can be offered the same fate. (Hoffman [4])

From this, it is abundantly clear that, during the second Dutch settlement from 1664, the red hen had inherited the dodo's name, the inference being that the true dodo was by then extinct, and, expecting to find flightless birds called *dodaers*, the settlers used that name for the only flightless bird they found. As Alfred Newton wrote 150 years ago:

... it would appear from this that in Hoffmann's time in Mauritius one common name for the dodo had been transferred to another species of bird in accordance with that odd process of substitution which has obtained in so many countries, where the rightful owner expiring bequeaths (as it were) its titles to a survivor [15]

John Marshall, an English visitor, travelling on the Unicorn, who landed in 1668 on the other side of the island and had no contact with the Dutch settlers [22,29], also employed a name transfer, even using two names for the bird:

Here are also great plenty of dodos, or red hens, which are larger a little than our English henns, have long beakes and no, or very little, Tayles. Their fethers are like downe, and their wings so little that it is not able to support their bodies; but they have long leggs and will runn very fast, that a man shall not take them, they will turne so about the trees. They are good meate when roasted, tasting somthing like pig, and their skin like pig skin when roasted [*sic*], being hard. (Marshall [11,44])

British mariners presumably also expected flightless "dodos" from past visits and thus likewise applied the name to the only flightless bird they saw. The ship's log [45] mentions goats, hogs ducks, and geese, but not "dodos".

There is further evidence of the dodo's absence in remarks made by Hubert Hugo in 1674. Having claimed that a dodaers had been caught in August 1673 [11,25], Hugo sent a team of men in January of the following year to search the interior for a fortnight in search for escaped African slaves reported to be hiding out somewhere. They discovered and detained an ex-slave named Simon, found in an encampment some 7–8 leagues into the interior, whom Hugo questioned about his life during the 11–12 years on the run [28] (items 650–667). In his report, Hugo wrote, *inter alia*, that:

He [Simon] also told us that even though he had been so long in the country, he had only twice seen a dodo, the size of a cassowary. These are apparently the dodos 'walgvogels' that are mentioned from the first discovery of the island. Nevertheless, it is the case that no Netherlander, however long his stay here, can truly say that he has seen one of these birds (Hugo in [28] (item 6660, [30]; ASC's translation of Leon Doyen's French translation of Hugo's Dutch). (see Supplementary Materials S1: note 4)

It is unclear whether Hugo specifically asked about dodos, or if Simon volunteered seeing larger birds that Hugo and the colonists had seen. The reference to *walgvogels*, the name used by the first Dutch visitors in 1598, makes clear that, by then, Hugo had become aware of and interested in true dodos, and that none of the settlers had ever seen one! Clearly, he must by then have realised, perhaps through belated reading, that what they (the settlers) had caught and were calling *dodaersen* were not actually dodos. This throws into sharp doubt the interpretation [11,22,25] that his 1673 claim referred to dodos rather than red hens. It is harder to interpret Simon's account as a reference to a cassowary, an Australasian bird known in Holland but unlikely to be familiar to an African slave, suggesting that Hugo may have asked leading questions. In any case, Simon would have wanted to stay on the right side of his captor, although it doesn't appear that Hugo recognised him; he had originally escaped from Hugo's own ship in 1662 [29]. It is clear from the tone of the discussion with Hugo [28] (items 650–667) that he was in fear of his life, so he may have offered answers he thought Hugo would like to hear. Hugo, on his earlier visit as a privateer, rescued a number of survivors (including Andries Stokram) of the shipwrecked *Arnhem* in November 1662 [21], but not the group that had found the dodos on *Ile d'Ambre* off the east coast; Stokram [46] later published an account, see below. The survivors Hugo rescued had not seen dodos. Those that had (including Evertsz), had already left in May on an English ship [21]. Hence, Hugo may not have been particularly aware of the dodo situation when he returned as *opperhoofd* in 1673. In late 1673, he wrote a long report, including wildlife information, that mentioned neither dodos nor red hens [47], and in his January 1674 diary, he mentioned species hunted by his teams—all large mammals, tortoises/turtles, and fish [28]. While Simon may well have

encountered scattered elderly dodos in the forest, or had seen them on Ile d’Ambre (if Evertsz left any survivors; see below), for the reasons given his account must be treated with caution, and there is no indication of when during 1662–1674 he had the claimed sightings.

In the context of these accounts, it is difficult to see how post-1674 references to undescribed *dodaersen/dodaarsen* can be construed as dodos; relying on Lamotius’ supposed and totally unproven knowledge of real dodos should not overrule the strong indications to the contrary. Given that the settlers had used *dodaers/dodaars* for red hens since the mid-1660s, and that no-one had reported two sorts of flightless bird for over twenty years, the obvious inference is that Lamotius was simply using local usage and reporting the capture of red hens by his hunting parties. Moreover, the large number [23] suggests that Lamotius’ birds were more common than those reported by Simon—in keeping with a red-hen identification, but evidently not with a dodo one. Likewise, Benjamin Harry, the crew whose ship Berkley Castle interacted with the Dutch for meat supplies [14,48], would have got the dodo name from the locals:

Now having a little respitt I will make a little descripti: of y^e Island first of its Producks and yn of itt parts—ffirst of winged and feathered ffowle y^e less passant. are Dodos whose fflesh is very hard (Harry in [6]).

The obsolete term ‘passant’ has had several somewhat contradictory meanings, but here appears to mean ‘excellent’ (the earliest recorded meaning according to the Oxford English Dictionary); Jackson’s argument (48) that Harry would not mistake red hens for dodos is based on misunderstandings [29]).

Harry also mentioned “reasonably good teal, curlews, flamingoes, turtle-doves, large bats, many small birds which are good [to eat]” [14]. The ship’s log of the *President* that was there at the same time [29,45] reported ducks and geese, but no mention of dodos (or red hens). Published logs of English ships that called during 1688–1690 for wildlife list only turtles and ungulates caught by dogs [14,45]. Faunal remains of animals eaten by members of the second Dutch settlement excavated at the site of Fort Frederick Hendrik at Grand Port do not include dodos, red hens, or indeed tortoises [49], suggesting the surviving deposits date from late in the period of occupation when all these were very rare or extinct.

Given that there had probably been no breeding on the mainland since the late 1630s, any surviving dodos in the 1680s would have been 45–50 years old, plausible for some seabirds and parrots, but way beyond anything known in pigeons [50] - the oldest known pigeon, a captive domestic *Columba livia*, lived 35 years, the oldest wild pigeon only 22; however, there are only data for a small proportion of pigeon species. However, the dodo was much larger than ordinary pigeons, and using the mass estimates of Heteren et al. [51] of 8–18 kg and Lindstedt and Calder’s [52] wild nonpasseriform model yields potential lifespans of 24–28 years for the dodo. Being a flightless insular bird, the dodo may have had a comparatively longer lifespan than volant columbids [42,53].

However, if a tiny number had somehow survived, bred in the interior, and had escaped all observation from 1664 to 1681 (or 1685), then these birds reported in the 1680s might have been dodos—but without any description to flesh out these *dodaersen*, and the clear evidence that the name had been used locally for red hens since the mid-1660s, it is reasonable to infer that these birds were in fact red hens.

5. Last Definite Dodos

It remains to sum up the details of the confirmed last dodo dates. As can be seen from Table A1, dodos were reported regularly on the Mauritian mainland up to and including 1638, but, apart from the bird exported in 1647, not thereafter. After that, we have only the Evertsz report in 1662 on the pigfree offshore islet.

On the mainland, the last in situ sightings are those of François Cauche’s associates in 1638, who reported details of their appearance and nest for him to imply he had seen them himself [4,6,40]. In that same year, Peter Mundy, admittedly on a very short visit, pointedly commented on not seeing any, while noting he had previously seen a couple in captivity in Surat, India (sometime during 1628–1634 [6,54]).

In Prince Maurice’s Island I have seen Birds bigger than Swans, without any Feathers on their Bodies, which are cover’d with a black Down, their Breech quite round, the Rump

adorn'd with curl'd Feathers, as many in Number as the Bird is Years old. Instead of Wings they have Feathers like those last mention'd, black and bowing. They have no Tongues, the Beak thick, bowing a little downwards, long scaly Legs, with only three Claws on each Foot. They make a Noise like a Goose, and are not so well relish'd as the *Fouches* and *Feiques* above mentioned (see Supplementary Materials S1: note 5). They lay but one Egg, as big as a Penny Loaf, by which they place a white Stone, as big as a Hens Egg, and that on Grass they bring together for the Purpose, and build their Nests in the Woods. If the young One be kill'd, there is a grey Stone found in its Guizard. We call them Birds of Nazareth, perhaps for having been found in the Island of Nazareth, which is above that of Prince Maurice, in 17 Degrees of South Latuitude. The Grease of these Birds is of excellent Use to supple the Nerves and Muscles. (Cauche, from the English translation of [40], in 1710, pp. 54–55)

The Dodo. Although wee now Mett with None, yett Divers tymes they are Found here, having seene 2 att Suratt broughtt From hence, and as I remember they are as bigge bodied as great Turkeyes, covered with Downe, having little hanging wings like shortt sleeves, altogether unusefull to Fly withall, or any way with them to helpe themselves. Neither Can they swymme butt as other land Fowle Doe [when] on Necessity Forced into the water, beeing Cloven Footed as they are. [55] (vol. 3 part 2, p. 352)

After this, the only definite record likely to be from the mainland is the well-attested account of one shipped as a rarity (together with a white deer) from Batavia (now Jakarta; the Dutch eastern capital) to the Dutch trading post at Deshima in Japan in 1647 [55,56]. In caves at Baie du Cap and Treize Cantons thought to have been temporarily occupied by maroons (escaped slaves), the presence of dodo bones with cut marks [57,58] indicates that the species was still present on the mainland post-1642, when slaves were first imported and escaped [21], although earlier occupation of the caves by shipwrecked mariners or visitors exploring cannot be ruled out (Amitava Chowdhury, pers. comm.). The presence of a didosaurus *Leiolopisma mauritiana* frontal bone in the Baie du Cap assemblage [57] (Chapter 7 plate 28; identification by Julian Hume, pers. comm.) means the bones were of mixed age, as this giant skink was extinct before the first Dutch arrived in 1598 [4]. There has been no published taphonomic analysis and no carbon dating (Chowdhury, pers. comm.) of the excavated sites, and no culturally identifiable artefacts found [58,59]; thus, more precise dates have so far not been determined. Chowdhury [57] illustrated faint apparent cut marks on a dodo's toe bone (), and mentioned cut marks on a vertebra and rib. However Julian Hume (pers. comm.) thinks these marks are not cut marks, but caused by some kind of post-deposition event; one might also ask why anyone would cut a toe bone, though extracting potentially useful tendons might be a possibility. Janoo's [24] (Figure 2) photograph of bones from the Baie du Cap site shows a tarsometatarsus with damage consistent with a blow from a blade, but that could be a natural cross-fracture on a deteriorated bone.

Apart from Cauche, Mundy, and the Japanese delivery, faunal accounts and indeed recorded visits during the first Dutch settlement (1638–1658) are lacking. The English ship *Dolphin* in 1644 reported only hogs and goats [14], and the limited Dutch accounts only refer to introduced ungulates [8,28,34]. Hence, there is currently a lacuna here in the dodo's history, though unpublished documents may yet be found to fill it.

Finally, there is Volkert Evertsz's account, following the shipwreck of the *Aernhem*, of wading out an offshore island where, inter alia, he and his companions found (and ate) dodos [6,12,18–20]. It is clear from his account and those of two other survivors ([46], Kerkhoven in [6]) that none was seen on the mainland. Although accessible on foot at low tide, Evertsz's faunal list indicates that while, there were goats on the islet, identified as *Ile d'Ambre* [19], there were no pigs or monkeys—in the absence of these predators, dodos could still successfully nest, until probably wiped out by the shipwrecked Dutchmen. The goats had clipped ears, indicating that they had been placed there by the Dutch of the first settlement [18,19]. By 1673, Hugo et al. [47] reported that goatherds were once again on the islet, blamed for wasteful slaughter of tortoises and goats—no mention of dodos.

Amongst these birds were those which in India they call *Dod-aersen* (being a kind of very big goose); these birds are unable to fly, and instead of wings, they merely have a few small pins, yet they can run very swiftly. We drove them together into one place in such a manner that we could catch them with our hands, and when we held one of them by its leg, and that upon this it made a great noise, the others all on a sudden came running as fast as they could to its assistance, and by which they were caught and made prisoners also. Here we also got some Mountain Partridges [*berghoenders*, i.e., Red Hens]; and as to wild Goats, these we could get as many as we pleased. We needed only to drive them together into a corner, running from the land towards the sea-side and making a kind of projecting island, when afterwards we ran with our five men amongst them, catching in this manner as many of them as we pleased. Some of the old goats had cuts in their ears, which made us suppose that they had been left there by the Netherlanders at the time they dwelled here on this island. (Evertsz, in [19])

The published records of dodos and red hens are in Table A1, and the pattern of sightings is summarized in Table A2. Unfortunately, the involved numbers are too low to allow for any statistical test.

Red hens, clearly still common in the 1670s and apparently (Lamotius's *dodaarsen*) the 1680s, probably succumbed to feral cats introduced around 1680 [4,11]; they were last mentioned, as having become rare, by Leguat [41] (*gelinotte*) in 1693–1696.

6. Discussion and Conclusions

The interpretation of wildlife reported in historical documents, particularly when described from the perspective of different biota and by people whose prime interest is not nature, can be problematic; Dutch settlers were traders and farmers, not naturalists. If wildlife is described or, better still, illustrated, then identification is often possible. If it is, not then it can be open to various interpretations. In the dodo and the red hen, we have a case where an introduced omnivore has decimated a formerly abundant bird, the humans lost interest in it as food (and stopped reporting on it), and then a hiatus in settlement (1658–1664) meant that no-one in the new group had ever seen the bird. However, there were references in books to, and possibly a folk memory of, flightless birds, so the remaining flightless species took on the name of the defunct original. Only one man, Hubert Hugo, appears to have belatedly been alert to this development, but his understanding clearly did not prevail in the community. So, while Hugo noted the disappearance, no-one else took this on board, as extinction was not yet an intellectual construct in the 17th century [10]. Only later, in opperhoofd Roelandt Diodati's time in the 1690s, did the disappearance of important food animals (tortoises, ducks, geese) seriously impact the settlers' consciousness [4,41]. It was not until Buffon [59] invited people in Mauritius to send him updated reports of dodos, and Morel [60] in 1778 reported their total absence, that their extinction was recognised [10]; it took another century for the likely culprit to be fingered [34]. Thus, the devastating impact of pigs on dodos in the mid-17th century was not fully appreciated for 200 years, despite the pigs' effects on tortoises and turtles being recognised at the time. Tortoises were a daily staple, dodos a fading memory—and it took 200 years for the impact on one animal to be recognised as the same as that on the other.

Supplementary Materials: The following are available online at <http://www.mdpi.com/2571-550X/3/1/4/s1>.

Author Contributions: Original draft preparation, A.S.C.; additional research, J.C.P.; review and editing, A.S.C., J.C.P.; All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: JCP had useful exchanges with Dan Sleight and Jan den Hengst, and ASC with Amitava Chowdhury and Julian Hume, who helped to clarify certain questions in this story.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Time series of all published dodo (*Raphus cucullatus*) and red hen (*Aphanapteryx bonasia*) records on Mauritius itself (birds seen elsewhere excluded), with indicated names and identities. Nationality (and hence language) of various observers: D = Dutch, E = English, F = French, G = German, P = Portuguese.

Date	Observer	Used Dodo Name	Description. (Y/N)	Identity	Image	Rail-Name Used	Description (Y/N)	Identity	Image	Reference
Presettlement Visits										
1598	(compilation) E	Walghstock	Y (minimal)	Dodo	N	-	-	-	-	[61]
1598	(compilation) D	Walchvoghel	Y (good)	Dodo	Y (poor)	-	-	-	-	[62]
1598	Heyndrick Jolinck D	(penguin)	Y (adequate)	Dodo	N	A: Indise riviers houdt snippen B: watersnippen	?	A: red hen B: migratory waders, or possibly Sauzier’s Rail <i>Dryolimnas chekei</i>	N	[11,63]
1598	Jacob van Heemskerck D	(unnamed)	Y (good)	Dodo	N	-	-	-	-	[63]
1598	Philips Grimmaert D	doederssen	Y (minimal)	Dodo	N	-	-	-	-	[63]
1598	Reijer Cornelisz D	(unnamed; like large penguins)	Y (adequate)	Dodo	N	-	-	-	-	[63]
1601	Joris Laerle + other artists D (images without text)	griffeendt, kermisgans, dronten	-	Dodo	Yx4 (v. good and OK)	-	-	Red hen	Y (v. good)	[64,65]
1602	Willem van West-Zanen D	dodaarsen, dronten	Y (minimal)	Dodo	‘Y’ 1 (penguins)	-	-	-	-	[66,67]
1602	Reijer Cornelisz (again) D	walchvogels	N	Dodo	N	velthoenderen, large and small	N	Red hen and Sauzier’s rail	N	[68,69]

Table A1. Cont.

Date	Observer	Used Dodo Name	Description. (Y/N)	Identity	Image	Rail-Name Used	Description (Y/N)	Identity	Image	Reference
1606	Cornelis Matelief D	dodaersen, dronten	Y (good)	Dodo	N	-	-	-	-	[6,14]
1607	Steven van der Hagen D	dodaersen	N	Dodo	N	-	-	-	-	[6,14]
1611	Johann Verken G	totersten, walckvögel	Y (good)	Dodo	N	A: feldhüner B: rebhüner ²	N	A: red hen B: Sauzier's rail?	N	[6,13,14] ³
1616	Manuel de Almeida P/anon.	ema ⁴	Y (min)	Dodo	N	-	-	-	-	[6,17]
1617	Pieter van den Broecke D (images without text)	-	-	Dodo	Y (OK)	-	-	Red hen	Y (poor)	[13]
1628	Emmanuel Altham E	DoDo	N	Dodo	N	-	-	-	-	[6,70]
1629	Thomas Herbert E	dodo	Y (good)	Dodo	Y (poor)	hen	Y (minimal)	Red hen	Y (poor)	[13,71]
1629	Jacques Le Febvre D	dodaers	N	Dodo	N	velthoenders	N	Red hen	N	[28] (item 302), [34,72]
1632	? Leonardus Wallesius D	dottaersen	Y (diet only)	Dodo	N	velthoenders	Y (behaviour only)	Red hen	N	[7,73]
1638	Peter Mundy E	dodo (but not seen in situ)	Y (good)	Dodo	N	Mauritius hen	Y (good)	Red hen	Y (good)	[6,11,54]
1638	François Cauche F (from associates)	oiseau de Nazare	Y (good)	Dodo	N	poule rouge	Y (good + behaviour)	Red Hen	N	[4,40]
First Dutch settlement 1638–1658										

Table A1. Cont.

Date	Observer	Used Dodo Name	Description. (Y/N)	Identity	Image	Rail-Name Used	Description (Y/N)	Identity	Image	Reference
1647	Willem Verstegen D	dodeers ⁵	N	Dodo	N	-	-	-	-	[55,56]
Interregnum 1658–1664; Arnhem shipwreck survivors										
1662	Volkert Evertsz	doddaerssen (only on Ile d’Ambre)	Y (good)	Dodo	N	veldthoenders (mainland), berghoenders (Ile d’Ambre)	N	Red hen	N	[18,19]
1662	Andries Stokram	(unnamed)	Y	(Dodo) ⁶	[?]	veldthoenders	N	Red hen	N	[6,27,46,74]
1662	Simon van den Kerckhoven	-	-	-	-	veldt-hoenders	N	Red hen	N	[6]
1662+	Simon (recaptured slave)	dodaers, walgvogels (Hugo’s names)	N	Dodo (if true)	N	-	-	-	-	[34] (paraphrased), [28] (item:666)
Second Dutch settlement 1664–1710										
1666–1669	Johannes Pretorius D	dodaers	Y (good)	Red hen	N	<< (see left)				[43]
1668	John Marshall E	dodos or red hens	Y (good)	Red hen	N	red hen << (see left)				[6,12,27,29,44]
1673–1675	Johann C.Hoffmann G	toddärsche	Y (good)	Red hen	N	<< (see left)				[6,12,16,17,27,29]

Table A1. Cont.

Date	Observer	Used Dodo Name	Description. (Y/N)	Identity	Image	Rail-Name Used	Description (Y/N)	Identity	Image	Reference
1673–1677	Hubert Hugo D	A. 1673: dodaers B. 1674: ‘dodo’ ⁷ , walgvogels	N N	? (see text) Dodo (but none seen by any current resident)	N N					A: [25] B: [28,29]
1681	Benjamin Harry E	dodo	N	? Red hen (see text)	N	<< (see left)				[12,14,27,29]
1685–1688	Isaac J.Lamotius D	dodaarsen	N	? Red Hen [see text]	N	<< (see left)				[6,22,25,29]
1691	François Leguat F	-	-	-	-	gelinotte (rare)	N	Red Hen	N	[11] (p.32),[41]

¹ The illustration, done long after the event by an artist interpreting the accounts of others, used penguins as models for the intended dodos [75]. ² Hume [11] considered the rebhüner to be introduced partridges, but there is no evidence whatsoever for introduced gamebirds of any kind during the Dutch period—they were later introduced by the French in the 18th century [4]; rebhüner are more likely to have been the other smaller flightless rail, Sauzier’s rail *Dryolimnas chekei* (renamed ‘Cheke’s Rail’ by Hume [11] when giving the previously recognised subfossil bones a scientific name for the first time).³ By an unknown observer with Verhoeven’s fleet according to Barnwell, but since identified as Verken [6].⁴ ema = cassowary (*Casuarus* sp.)—Almeida described the Dodo as like a young ostrich, and the anonymous account of the same visit used the cassowary name, clearly cognate with English ‘emu’ for the related Australian ratite.⁵ There are no known faunal lists including birds for the period of the first Dutch settlement, and the only mention of a dodo is not in Mauritius itself, but of a bird shipped to the Dutch trading post in Japan. Although not part of a faunal list for Mauritius, this record was included in the table as it indicates the continued existence of dodos on the island in or around 1647, although no description was given of the bird. However, as the bird was a gift to the Japanese governor as a rarity, and as red hens were then still common (see later table entries), it is most probable that this dodeers was a real dodo, as Winters and Hume [56] pointed out.⁶ Stokram described but did not name the dodo, but his description (and of other fauna in his list) is clearly taken from earlier writings, notably the Tweede boeck [6,20,21,27], implying that he did not see the species himself; however, he did report having eaten veldthoenders, i.e., red hens. One edition of his account includes an editor-commissioned illustration that shows a hunting party and a large bird [5,21] but, although often considered a dodo, it is short-billed and looks more like a goose. Since the entire scene was imagined back in Holland, its appearance may be of little identification value.⁷ We only have the French translation of Hugo’s account [28,29], though we can assume he used the term dodaers, which he also assimilated to walgvogels.

Table A2. Dodo and red-hen record distribution in five historical time periods from first Dutch landing to 1688.

Date Period	Description	Accounts of Two Flightless Species/Only One Flightless Species Reported	Reports Including Definite Dodos/Accounts Reporting Only Dodos	Reports Including Definite Red Hens/Accounts Reporting Only Red Hen	Notes
1598–1638	Presettlement	9/10	19/10	9/0	Red hens only noted if dodos also seen; dodos clearly the main attraction.
1638–1658	first settlement	0/1	1/0	0/0	Poor data; the only report of either species is the dodo shipped to Japan via Batavia.
1662	Arnhem survivors	1/2	1/0	3/2	No dodos seen on mainland, only on Ile d’Ambre.
1662(–1674)	Simon (maroon slave)	0/1	1/0	0/0	Two claimed dodo sightings, dates unknown, earlier date more probable; see text
1664–1676	Second settlement A	0/4	0/0	3/3	Three accounts used dodo names but described red hens, one account used dodaers without description (Hugo in 1673); no descriptions of dodos, and, in 1674, Hugo says none have been seen during the second settlement (i.e., since 1664).
1681–1688	Second settlement B	0/2	0/0	0/0	Harry’s account, and as many as 50 dodaarsen reported by Lamotius as caught during 1685–1688 ¹ ; none described, though Harry commented on bird’s taste.

¹ Entry relating to two dodos for 25 November 1688 in Parish [6] was a mistake based upon a pers. comm. (2008) from Jan den Hengst. Sleigh [23] mentioned 50 captured “dodos” in the same period, without further detail. There are no mentions of native birds of any kind in Lamotius’s reports of 1683 [14] or 1690 [28], nor in his journal entries of June–September 1678 and April 1682 [28].

References

- Whittaker, R.J.; Fernández-Palacios, J.M. *Island Biogeography: Ecology, Evolution and Conservation*, 2nd ed.; Oxford University Press: Oxford, UK, 2007; p. 416.
- Gillespie, R.; Clague, D. (Eds.) *Encyclopedia of Islands*; University of California Press: Berkeley, CA, USA, 2009; p. 1074.
- Burney, D.A.; Flannery, T.F. Fifty millennia of catastrophic extinctions after human contact. *Trends Ecol. Evol.* **2005**, *20*, 395–401. [[CrossRef](#)]
- Cheke, A.S.; Hume, J.P. *Lost Land of the Dodo: An Ecological History of Mauritius, Réunion and Rodrigues*; A&C Black: London, UK; Yale University Press: New Haven, CT, USA, 2008; p. 464.
- Alvi, M.A.; Rahman, A. (Eds.) *Jahangir the Naturalist*; National Institute of Science of India: New Delhi, India, 1968; p. 140.

6. Parish, J.C. *The Dodo and the Solitaire: A Natural History*; Indiana University Press: Bloomington, IN, USA, 2013; p. xxii, 407.
7. Cheke, A.S.; Beentje, H. Citizen animals, dodo mayors—The curious account of a visit to Mauritius in 1632. *Phelsuma* **2016**, *24*, 1–5.
8. Bonaparte, R. *Le Premier Établissement Des Néerlandais à Maurice*; published by the author: Paris, France, 1890; p. 60.
9. Newton, A.; Gadow, H. *A Dictionary of Birds*; A. & C. Black: London, UK, 1896; p. 1088.
10. Turvey, S.T.; Cheke, A.S. Dead as a dodo: the fortuitous rise to fame of an extinction icon. *Hist. Biol.* **2008**, *20*, 149–163. [[CrossRef](#)]
11. Hume, J.P. Systematics, morphology and ecology of rails (Aves: Rallidae) of the Mascarene Islands, with one new species. *Zootaxa* **2019**, *4626*, 1–107. [[CrossRef](#)]
12. Cheke, A.S. An ecological history of the Mascarene Islands, with particular reference to extinctions and introductions of land vertebrates. In *Studies of Mascarene Island Birds*; Diamond, A.W., Ed.; Cambridge University Press: Cambridge, UK, 1987; pp. 5–89.
13. Strickland, H.E. History and external characters of the Dodo, Solitaire and other extinct brevipennate birds of Mauritius, Rodriguez and Bourbon. In *The Dodo and Its Kindred*; Strickland, H.E., Melville, A.G., Eds.; Benham & Reeve: London, UK, 1848; pp. 3–65.
14. Barnwell, P.J. *Visits and Despatches, 1598–1948*; Standard Printing Establishment: Port Louis, Mauritius, 1948; p. 306.
15. Newton, A. Recent ornithological publications. *Ibis* **1868**, *4*, 472–486.
16. Hoffmann, J.C. *Oost-Indianische*; Voyage: Cassel, Germany, 1680. [Reprinted 1931, The Hague: Martinus Nijhoff; section on Mauritius reproduced (in French) in Grandidier & others (1903–20) 3: 368–380, q.v.]
17. Grandidier, A.; Charles-Roux, J.; Delhorbe, C.; Froidevaux, H.; Grandidier, G. (Eds.) *Collection des Ouvrages Anciens Concernant Madagascar*; Comité de Madagascar: Paris, France, 1903.
18. Olearius, A. (Ed.) *Orientalische Reise-Beschreibunge Jürgen Andersen aus Schlefswig der An. Christi 1644. außgezogen und 1650. Wieder Kommen. Und Volquard Iversen Aus Holstein so An. 1655. Außgezogen Und 1668. Wieder Angelanget*; Johan Holwein: Schlefswig, Germany, 1669; [also Dutch ed; Jan Rieuwertsz & Pieter Arentsz: Amsterdam, The Netherlands, 1670].
19. Cheke, A.S. The Dodo's last island. *Proc. R. Soc. Arts Sci. Mauritius* **2004**, *7*, 7–22.
20. Van Wissen, B. (Ed.) *Dodo Raphus cucullatus*; Zoölogisch Museum, Amsterdam University: Amsterdam, The Netherlands, 1995; p. 102.
21. Moree, P.J. *A Concise History of Dutch Mauritius, 1598–1710*; Kegan Paul International: London, UK; International Institute of Asian Studies: Leiden, The Netherlands, 1998; p. 127.
22. Den Hengst, J. The dodo and scientific fantasies: durable myths of a tough bird. *Arch. Nat. Hist.* **2009**, *36*, 136–145. [[CrossRef](#)]
23. Sleigh, D. The economy of Mauritius during the second Dutch occupation (1664–1710). In *Globalisation and the South-West Indian Ocean*; Evers, S.J.T., Hookoomsing, V.Y., Eds.; International Institute for Asian Studies: Leiden, the Netherlands; University of Mauritius: Réduit, Mauritius, 2000; pp. 51–56.
24. Janoo, A. Discovery of isolated dodo bones *Raphus cucullatus* (L.), Aves, Columbiformes from Mauritius cave shelters highlights human predation, with a comment on the status of the family Raphidae Wetmore. 1930. *Ann. Paléontol.* **2005**, *91*, 167–180. [[CrossRef](#)]
25. Hume, J.P.; Martill, D.M.; Dewdney, C. Dutch diaries and the demise of the dodo. *Nature* **2004**, *429*, 622. [[CrossRef](#)]
26. Holthuis, L.B.; Pietsch, T.W. *Les Planches Inédites de Poissons et Autres Animaux Marins de l'Indo-Ouest Pacifique d'Isaac Johannes Lamotius*; Muséum Nationale d'Histoire Naturelle: Paris, France, 2006; p. 292.
27. Cheke, A.S. Establishing extinction dates—The curious case of the Dodo and the Red Hen. *Ibis* **2006**, *148*, 155–158. [[CrossRef](#)]
28. Staub, F.; Herbereau de Lachaise, A. (Eds.) *Papiers Doyen—Du XVIe au XIXe Siècle, un Aperçu de l'Histoire de Maurice, et Proceedings de la Société*; Royal Society of Arts & Sciences of Mauritius: Réduit, Mauritius, 2013.
29. Cheke, A.S. Speculation, statistics, facts and the Dodo's extinction date. *Hist. Biol.* **2014**, *27*, 624–633. [[CrossRef](#)]
30. Roberts, D.L.; Solow, A.R. When did the dodo become extinct? *Nature* **2003**, *426*, 245. [[CrossRef](#)] [[PubMed](#)]

31. Roberts, D.L. Refuge-effect hypothesis and the demise of the dodo. *Conserv. Biol.* **2013**, *27*, 1478–1480. [[CrossRef](#)] [[PubMed](#)]
32. Grove, R.H. *Green Imperialism Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism*; Cambridge University Press: Cambridge, UK, 1995; p. 540.
33. Cheke, A.S. Is the bird a Dodo? The wildlife of a mid-seventeenth century drawing of Dutch Mauritius. *Arch. Nat. Hist.* **2001**, *29*, 347–351. [[CrossRef](#)]
34. Pitot, A. *T'Eylandt Mauritius. Esquisses Historiques (1598–1710). Précédés d'une Notice sur la Découverte des Mascareignes et Suivies d'une Monographie du Dodo, des Solitaires de Rodrigue et de Bourbon et de l'Oiseau Bleu*; Coignet Frères & Cie: Port Louis, Mauritius, 1905; p. xv+372.
35. Newton, E. Address by the President, Sir Edward Newton KCMG FLS CMZS, to the members of the Norfolk and Norwich Naturalists' Society. *Trans. Norfolk Norwich Nat. Soc.* **1888**, *4*, 537–554.
36. Baker, J.K. The feral pig in Hawaii Volcanoes National Park. *Trans. Calif. Nev. Sect. Wildl. Soc.* **1975**, 74–80.
37. Ditchkoff, S.S.; Mayer, J.J. Biology of wild pigs: Wild pig food habits. In *Wild Pigs: Biology, Damage, Control Techniques and Management*; Mayer, J.J., Brisbin, I.L., Jr., Eds.; Savannah River National Laboratory: Aiken, SC, USA, 2009; pp. 105–143.
38. McFarland, C.G.; Villa, J.; Toro, B. The Galapagos tortoises (*Geochelone elephantopus*). Part 1. Status of the surviving populations. Part 2. Conservation Methods. *Biol. Conserv.* **1974**, *6*, 118–133. [[CrossRef](#)]
39. Cruz, F.; Donlan, C.J.; Campbell, K.; Carrion, V. Conservation action in the Galapagos: feral pig (*Sus scrofa*) eradication from Santiago Island. *Biol. Conserv.* **2005**, *121*, 473–478. [[CrossRef](#)]
40. Cauche, F. *Relation du Voyage que François Cauche de Rouen à Fait à Madagascar, Îles Adjacentes et Coste d'Afrique. Receuilly par le Sieur Morisot, avec Notes en Marge*; Augustin Courbe: Paris, France, 1651; p. x+194.
41. Leguat de la Fougère, F. *Voyage et Aventures de François Leguat & de Ses Compagnons en Deux Îles Désertes des Indes Orientales*; J.J.de Lorme: Amsterdam, The Netherlands, 1707.
42. Livezey, B.C. Evolution of flightlessness in rails (Gruiformes: Rallidae): Phylogenetic, ecomorphological, and ontogenetic perspectives. *Ornithol. Monogr.* **2003**, *53*, 1–654. [[CrossRef](#)]
43. Hume, J.P.; Winters, R. Captive birds on Dutch Mauritius: bad-tempered parrots, warty pigeons and notes on other native animals. *Hist. Biol.* **2015**, *28*, 812–822. [[CrossRef](#)]
44. Khan, S.A. (Ed.) *John Marshall in India. Notes and Observations in Bengal*; Oxford University Press: Oxford, UK, 1927; p. 471.
45. Barnwell, P.J. (Ed.) Extracts from ships' logs visiting Mauritius. *Rev. Retrosop. Ile Maurice* **1950**, 1–6, 17–24, 54, 77–94, 131–136, 139–146, 195–210, 259–262, 265–274, 317–320, 324–332.
46. Stokram, A. *Korte Beschryvinge Van De Ongeluckige Weer-Om-reys Van Het Schip Aernhem*; Jan van Duisberg: Amsterdam, The Netherlands, 1663; p. 19.
47. Hugo, H.; Claasen, J.; Zacharyas, J.; Westfaber, J. Missive from Hubert Hugo [1673]. In *The Dutch Odyssey. Encounter with Mauritius*; Panyandee, S., Ed.; Mahatma Gandhi Institute: Moka, Mauritius, 2002; pp. 60–74.
48. Jackson, A. Added credence for a late Dodo extinction date. *Hist. Biol.* **2013**, *26*, 699–701. [[CrossRef](#)]
49. Peters, N.; Van Neer, W.; Debruyne, S.; Peters, S. Late 17th century AD faunal remains from the Dutch 'Fort Frederik Hendrik' at Mauritius (Indian Ocean). *Archaeofauna* **2009**, *18*, 159–184.
50. Carey, J.R.; Judge, D.S. *Life Spans of Mammals, Birds, Amphibians, Reptiles, and Fish*; Odense Monographs on Population Aging 8. Odense University Press: Odense, Denmark, 2000; p. 214.
51. Van Heteren, A.H.; van Dierendonk, R.C.H.; Van Egmond, M.A.N.E.; Ten Hagen, S.L.; Kreuning, J. Neither slim nor fat: estimating the mass of the dodo (*Raphus cucullatus*, Aves, Columbiformes) based on the largest sample of dodo bones to date. *Peer J.* **2017**, *5*, e4110. [[CrossRef](#)]
52. Lindstedt, S.L.; Calder, W.A. Body Size and Longevity in Birds. *Condor* **1976**, *78*, 91–94. [[CrossRef](#)]
53. Livezey, B.C. An ecomorphological review of the dodo (*Raphus cucullatus*) and solitaire (*Pezophaps solitaria*), flightless Columbiformes of the Mascarene Islands. *J. Zool. Lond.* **1993**, *230*, 247–292. [[CrossRef](#)]
54. Mundy, P. *The Travels of Peter Mundy in Europe and Asia*; Temple, R.C., Ed.; Hakluyt Society: London, UK, 1919–1936; 5 vols.
55. Millies, H.C. Over eene nieuw ontdekte afbeelding van den Dodo (*Didus ineptus*). *Natuurk. Verh. K. Akad. Wet. Amst.* **1868**, *11*, 1–20.
56. Winters, R.; Hume, J.P. The dodo, the deer and a 1647 voyage to Japan. *Hist. Biol.* **2014**, *27*, 258–264. [[CrossRef](#)]

57. Chowdhury, A. *Maroon Slave Archaeological Investigation Project in the Republic of Mauritius. Project Report. November 2003*; University of Mauritius: Réduit, Mauritius, 2003.
58. Chowdhury, A.; Goucher, C. Marronage in Mauritius and its possible implications for Caribbean archaeology. In *Proceedings of the Twenty-First Congress of the International Association for Caribbean Archaeology*; Reid, B.A., Roget, H.P., Curet, L.A., Eds.; St. Augustine Press: Trinidad, 2007; Volume 2, pp. 567–572.
59. Buffon, G.L.; LeClerc, Comte de. *Histoire Naturelle des Oiseaux*; Imprimerie Royale: Paris, France, 1770–1783; [3 original editions with variable numbers of volumes, published over more or less the same dates; one, in 10 vols., includes the *Planches Enluminées* by Martinet].
60. Morel, A. Sur les oiseaux monstrueux nommés *Dronte, Dodo, Cygne capuchonné, Solitaire & Oiseau de Nazare* & sur la petite isle de sable à 50 lieues environ de Madagascar. *Obs. Phys. Hist. Nat. Arts Paris* **1778**, *12*, 154–157.
61. Anon. *A True Report of the Gainfull, Prosperous and Speedy Voiage to Iava in the East Indies Performed by a Fleete of Eight Ships of Amsterdam*; W. Apsley: London, UK, 1599.
62. Anon. *Het Tweede Boeck. Journael oft Dagh-Register Inhoudende een Warachtich Verhael Ende Historische Vertellinghe Vande Reyse, Gedaen Door de Acht Schepen van Amstelredamme*; Cornelis Claesz: Amsterdam, The Netherlands, 1601.
63. Keuning, J. (Ed.) *De Tweede Schipvaart der Nederlanders naar Oost-Indië onder Jacob Cornelisz. van Neck en Wybrant Warwijk 1598-1600. Journalen, Documenten Andere Beschieden*. Martinus Nijhoff: s'Gravenhage, The Netherlands, 1938. 51. 5 vols (in 6) + 2 of maps.
64. Moree, P.J. *Dodo's en Galjoenen. Die Reis van het Schip Gelderland Naar Oost-Indië, 1601–1603*; Walburg Pers: Zutphen, The Netherlands, 2001; p. 348.
65. Hume, J.P. The journal of the flagship *Gelderland*: Dodo and other birds on Mauritius, 1601. *Arch. Nat. Hist.* **2003**, *30*, 13–27. [[CrossRef](#)]
66. Soeteboom, H. (Ed.) *Schipper Willem van West-Zanen's Reys na de Oost-Indien, A° 1602 &c*; [This is the running head—for the long & obscure full title see refs. 13 or 20]; H. Soeteboom: Amsterdam, The Netherlands, 1648; p. viii+60.
67. Cheke, A.S.; Beentje, H. Exploring at second-hand: Separating the editor from the traveller in Soeteboom's version of van West-Zanen's sojourn in Mauritius in 1602. *J. R. Soc. Arts Sci. Mauritius* **2019**, *1*, 37–47.
68. Parmentier, J.; Davids, K.; Everaert, J. (Eds.) *Peper, Plancius en porselein. De reis van het schip Swarte Leeuw naar Atjeh en Bantam, 1601–1603*; Walburg Pers: Zutphen, the Netherlands, 2003; p. 256.
69. Cheke, A.S. A single comma in a manuscript alters Mauritius avian history. *Phelsuma* **2013**, *21*, 1–3.
70. Newton, A. On a living Dodo shipped for England in 1628. *Proc. Zool. Soc. Lond.* **1876**, *447–449*, *Trans. R. Soc. Arts Sci. Mauritius* **1876**, *NS 9*, 34–38.
71. Herbert, T. *A Relation of Some Yeares Travaile, Begunne Anno 1626. Into Afrique and Greater Asia, Especially the Territories of the Persian Monarchie: and Some Parts of the Orientall Indies and Iles Adjacent*; William Stansby: London, UK, 1634; p. 225.
72. Leupe, P.A. Willem Jansz. van Amsterdam, Admiraal en Willem Jansz. van Amersfoort, Vice-Commandeur der O. I. C. in de Eerste Helft der 17de Eeuw. *Bijdragen tot de taal-, land- en volkenkunde van Nederlandsch-Indië* **1872**, *19*, 298–360. [[CrossRef](#)]
73. Winters, R.; Hume, J.P.; Leenstra, M. A famine in Surat in 1631 and Dodos on Mauritius: a long lost manuscript rediscovered. *Arch. Nat. Hist.* **2017**, *44*, 134–150. [[CrossRef](#)]
74. Schaling, L.; Roeper, V. (Eds.) *Korte Beschryvinge van de Ongeluckige Weer-on-Reys van het Schip Aernhem, in 1663 door Andries Stokram Beschreven. Opnieuw Uitgegeven en van Commentar*; Terra Incognita: Amsterdam, The Netherlands, 1991; p. 72.
75. Hume, J.P. The history of the Dodo *Raphus cucullatus* and the penguin of Mauritius. *Hist. Biol.* **2006**, *18*, 65–89. [[CrossRef](#)]

