In 1758, Carl von Linné (Linnaeus) published the tenth edition of Systema Naturae, in which he formally described the most unique group of primates: lemurs. The story of the early human-mediated dispersal of lemurs from Madagascar, prior to their formalized descriptions, is a complex one. It touches on the birth of the standardization of modern zoology, empire building, and the growth of international trade and commerce, with many Fellows of the Royal Society contributing to the earliest observations of these animals in captive settings. Through the use of historical documents and artwork, we present this history in four parts: ‘Part I: The lemurs that became ‘lemurs’ (1746–1756)’, discusses the specific lemurs that Linnaeus used to describe the genera in the tenth and twelfth editions of Systema Naturae; ‘Part II: Establishing the trade routes (1500–1662)’, examines seventeenth century captive lemurs and the role of the trade routes of the East India Companies in the transportation of lemurs from Madagascar; ‘Part III: Tracing the Bugée (1693–1732)’, reviews the lemurs identified by late seventeenth and early eighteenth century pre-Linnaean naturalists; and ‘Part IV: The chained lemur (1732–1761)’, concludes with eighteenth century lemurs in menageries and as luxury goods.

Keywords: Linnaeus, lemur, art, captivity, taxonomy

INTRODUCTION

Whereas lemurs are indelibly linked to Madagascar as a unique group of signature species, they are also dispersed in zoological parks throughout all corners of the world. In fact, Lemur catta (Linnaeus, 1758; ring-tailed lemur), the type species for the genus, is the most commonly housed primate in zoos. However, there was a time when they were unknown outside of Madagascar, and before their formal designation as ‘lemurs’.

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1 M. LaFleur, T. A. Clarke, J. Razimafy and K. Reuter, ‘Ring-tailed lemur Lemur catta (Linnaeus, 1758)’, in Primates in peril: the world’s 25 most endangered primates 2014–2016 (ed. C. Schweitzer, R. A. Mittermeier, A. B. Rylands, F. Chiozza),

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Carl von Linné (Linnaeus, 1707–1778; FRS 1753) originally coined the term in 1754 in reference to another strepsirrhine, the slender loris, initially *Lemur tardigradus*, and later revised as *Loris tardigradus*. The specific individual upon which the lemur type is based was brought to London ten years prior on an East Indiaman, and described in captivity.

The story of the early human-mediated dispersal of lemurs from Madagascar, before they were ‘lemurs’, is a complex one. It touches on the birth of the standardization of modern zoology, empire building, and the growth of international trade and commerce. As described by Ian Tattersall in *The primates of Madagascar* (1982):3

As empires expanded, and the thirst for knowledge of new and exotic creatures increased … this was a time when new zoological specimens were flooding into Europe from all over the world, at a rate matched only by the desire to bestow new names …

We present this history in four parts: ‘Part I: The lemurs that became ‘lemurs’ (1746–1756)’, discusses the specific lemurs that Linnaeus used to describe the genera in the tenth and twelfth editions of *Systema Naturae*; ‘Part II: Establishing the trade routes (1500–1662)’, examines seventeenth century captive lemurs and the role of the trade routes of the East India Companies in the transportation of lemurs from Madagascar; ‘Part III: Tracing the Bugée (1693–1732)’, reviews the lemurs identified by late seventeenth and early eighteenth century pre-Linnaean naturalists; and ‘Part IV: The chained lemur (1732–1761)’, concludes with eighteenth century lemurs in menageries and as luxury goods.

**PART I: THE LEMURS THAT BECAME ‘LEMURS’ (1746–1756)**

The modern scientific classification of lemurs (see electronic supplementary material) originates in Linnaeus’ tenth edition of *Systema Naturae* (1758).4 Prior to standardized binomial nomenclature, single species had multiple colloquial and scientific names, leading to confusion as to what was described, and renaming with each new system. Linnaean nomenclature became a *lingua franca* for those invested in the categorization and dissemination of knowledge about the natural world.

For many fauna, the type species have their origins in this edition, and for lemurs, so too does the type genus. Linnaeus’ description of *Lemur catta* was based on a copper plate in *A Natural History of Birds* (1751) by George Edwards (1694–1773, FRS 1757; figure 1).5 The Librarian for the Royal College of Surgeons, Edwards is considered the father of British...
ornithology. He cared for this ‘Maucauco’ after his friend, Isaac Worth, brought it from Madagascar in 1748 upon his return from India. Worth was the captain of the East Indiaman *Houghton*, which was in service from 1738 to 1749. The ship embarked from
the Downs off the coast of Kent in the spring of 1746. By September, the conditions on the ship led to more than 60 crew members developing scurvy. Edwards’s Maucauco ended up on board the Houghton as a consequence of the weather. Storms disabled the ship on its first approach to the Cape of Good Hope, necessitating turning back eastward and recovering on Madagascar for three months. The island was not otherwise on the homeward route from Bengal. Captain Worth, with the ring-tailed lemur in tow, began the return voyage from the Cape on 3 November 1748.

Notably, Edwards’s Maucauco errs with regard to its distinguishing feature—the ringed-tail. The two depictions, foreground and background, display at least 22 and 19 black rings, respectively. Ring-tailed lemurs have 12 or 13 white rings and 13 or 14 black rings in an alternating pattern. Given that Edwards possessed this lemur, the error is likely a result of artistic licence. This is important to note, as the majority of the ring-tailed lemurrs presented in this paper have more than the accepted range of rings. However, this, by itself, should not exclude them as depictions from life.

Although the ‘Maucauco’ is considered the model specimen for what are now ring-tailed lemurs, Linnaeus named the species at least a year prior to the publication of the tenth edition of Systema Naturae. Given the breadth of the undertaking and the limitations of global travel in the mid-eighteenth century (in his lifetime, Linnaeus only travelled as far as England outside his native Sweden), he enlisted ‘apostles’ to travel to the farthest reaches of the world, to seek out and document the plants and animals they encountered. Olof Torén (1718–1753), as chaplain of the Swedish East Indiaman Götha Leijon (Gothic Lion), from 22 February 1750 to 26 July 1752, was one of these men. Upon his return to Sweden, and shortly before his death in 1753, he wrote Linnaeus a series of letters detailing his voyage.

These letters were published first by Pehr Osbeck (1723–1805), another apostle, in his book Dagbok öfwer en Ostindisk resa åren 1750, 1751, 1752. Torén recounts landing on ‘St. Johanna’ (modern Anjouan) in August 1750, capturing an animal, and bringing it onboard:

> We here caught an animal (Lemur catta) whose colour was reddish, but its back of a greyish-brown: about the ears it looked like a fox: the tail was grey, with black rings, about one third part longer than the body, and is set an end by the animal like that of a squirrel; but has shorter hair: the snout was pointed. (The reason why I give this description, though so incomplete, is, because I fear that some might mistake it for a species of ape, to which the feet would lead one: for it has five flat round nails, but the thumb on the hind-feet is very large, and the first finger had a tapering nail). The teeth were, as far as I could see, not like of monkies; for I observed no canine ones: and when there was more than one serrated primary tooth in the upper-jaw, there were at least five little ones.

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6 J. Sutton, The East India Company’s Maritime Service, 1746–1834: masters of the eastern seas, vol. 6 (Boydell Press, Woodbridge, Suffolk, 2010).
7 B. S. Baliga, Records of the Fort St. George: Fort St. David Consultations, 1747, vol. XV (Government Press, Madras, 1935).
8 M. Boucher, Cape of Good Hope and foreign contacts, 1735–1755 (University of South Africa, Pretoria, 1985).
9 J. L. Geber, ‘The East India Company and southern Africa: a guide to the archives of the East India Company and the Board of Control, 1660–1858’, PhD thesis, University of London, 1998.
10 D. E. Wilson and E. Hanlon, ‘Lemur catta (Primates: Lemuridae)’, Mammalian Species 42, 58–74 (2010).
11 R. Pulteney and C. Linnaeus, A general view of the writings of Linnaeus: to which is annexed the diary of Linnaeus, written by himself, and now translated into English, from the Swedish manuscript in the possession of the editor (Cambridge University Press, New York, 2011).
12 IK Workshop Society, ‘Olof Torén’, https://www.ikfoundation.org/efacts/oloftoren.php.
13 P. Osbeck, Dagbok öfwer en Ostindisk resa åren 1750, 1751, 1752 (Lor. Ludv. Greiving, Stockholm, 1757).
14 P. Osbeck, O. Torén and C. G. Ekeberg, A voyage to China and the East Indies, vol. 1 (B. White, London, 1771), p. 168.
He states that he ‘might have had the opportunity on this voyage of examining several more exactly; but they [could not] be procured without paying for them.’ The animal died during the voyage and was thrown overboard. The original 1757 Swedish publication contains simply the designation ‘Lemur Catta’ by Linnaeus, while later printings, including the 1771 English *A Voyage to China and the East Indies* state ‘Lemur catta Linn. or Macauco of Edwards’. Linnaeus spent 1756 writing the tenth edition, likely developing the name concurrently with Osbeck’s publication. Torén states that it ‘live[d] in Madagascar and Mauritius’; however, this lemur was procured on Anjouan. As there are no ring-tailed lemurs native to the Comoros, necessarily it was brought there from Madagascar. This is not particularly far-fetched given the proximity and the trade in lemurs that Torén himself describes.

Two other lemurs captured by Edwards in his *Gleanings of Natural History* (1758)\(^\text{15}\) were models for the specimens described by Linnaeus in the twelfth edition (1766), ‘The Mongooz’ and ‘The Black Macauco’ (figure 2).

In 1753, the mongoose lemur (*Eulemur mongoz*, Linnaeus, 1766) was among the menagerie of Mrs Sidney Kennon, the midwife to Queen Caroline, delivering George III in 1738. This female lemur, drawn by Edwards in 1754, ‘fed on fruits, herbs, and almost any thing, even living fishes’.\(^\text{16}\) Edwards also described seeing ‘three or four’ others at the St Bartholomew Fair in London in 1753. The black lemur (*E. macaco*, Linnaeus, 1766) was living in 1755 with the Clerk to the Society of Surgeons, Mr Critington, and depicted the same year. It was incorrectly thought to be a female, which is an interesting mistake given the stark sexual dichromatism of the species.\(^\text{17}\) It fed on ‘vegetables … cakes, bread and butter, and summer fruits’ and was described as a ‘very sociable, gentle, and harmless-natured animal, not having the cunning mischievousness or malice of the monkey kind’.

All the models for *Lemur catta*, *Eulemur mongoz*, and *E. macaco* were based on captive animals that managed to survive the long journey back from Madagascar, generally taking several months, on ship’s rations. They lived in England in non-natural habitats and consumed non-natural food, which likely impacted their health. Even in the twenty-first century, zoos modulate captive dietary composition to find a delicate balance between providing cultivated foods (especially fruits, which often differ in nutritional composition from native or endemic species consumed in the wild), and maintaining the overall health of the lemurs.\(^\text{18}\) While these animals represent the nascence of ‘lemurs’ as we know them today, they also denote the conclusion of the era of the unnamed (by scientific standards), curious primates from Madagascar.

**PART II: ESTABLISHING THE TRADE ROUTES (1500–1662)**

The modern era of European travel to Madagascar began when the Portuguese explorer Bartolomeu Dias rounded the Cape of Good Hope in 1488. Twelve years later, another

15 G. Edwards, *Gleanings of Natural History: exhibiting figures of quadrupeds, birds, insects, plants, & c. Most of which have not, till now, been either figured or described* (Royal College of Physicians, London, 1758).

16 Ibid., pp. 12–13.

17 Tattersall, *op. cit.* (note 3), pp. 13–14.

18 S. A. Goodchild and C. H. Schwitzer, ‘The problem of obesity in captive lemurs’, *Int. Zoo News* 55, 353–357 (2008); R. E. Junge, C. V. Williams and J. Campbell, ‘Nutrition and behavior of lemurs’, *Vet. Clin. North Am. Exotic Anim. Pract.* 12, 339–348 (2009); A. Caravaggi, A. Plowman, D. J. Wright and C. M. Bishop, ‘The composition of captive ruffed lemur (*Varecia* spp.) diets in UK zoological collections, with reference to the problems of obesity and iron storage disease’, *J. Zoo Aquar. Res.* 6, 41–49 (2018).
Portuguese expedition around the Cape was fateful for both Dias and his brother Diogo. Bartolomeu’s ship was lost at sea and Diogo’s went wildly off-course. Their eastern trajectory resulted in the first modern European sighting of Madagascar on 10 August 1500, St Lawrence’s day. The island was named São Lourenço in honour of this.

Despite the early in-roads of the Portuguese, and nearly a century of domination over sea trade, there is a conspicuous lack of known early sources documenting their transport of lemurs from Madagascar. An explanation for this might be that they had mostly abandoned the island by as early as the mid-sixteenth century owing to hostilities with the Malagasy people, and the perceived lack of viable, exploitable resources (i.e. gold, ivory and spices). However, the royal family of Portugal, particularly during the reigns of Manuel I (1498–1521) and his son John III (1521–1557), were renowned for their menageries. Catherine of Austria (1507–1578), the wife of John III, had a global network of agents for the procurement of exotic animals, and was the supplier to the other Habsburg households throughout Europe. Therefore, lemurs almost certainly left Madagascar during the sixteenth century for Portugal, but the documentation is not known.

19. B. G. Hoffman, ‘Account of a voyage conducted in 1529 to the New World, Africa, Madagascar, and Sumatra, translated from the Italian, with notes and comments.’ Ethnohistory 10, 1–79 (1963); M. Newitt, ‘The Comoro Islands in Indian Ocean trade before the 19th Century’, Cah. Étud. Afr. 89–90, 139–165 (1983).
20. A. P. De Tudela and A. J. Gschwend, ‘Renaissance menageries. Exotic animals and pets at the Habsburg Courts in Iberia and Central Europe’, in Early modern zoology: the construction of animals in science, literature and the visual arts (ed. K. A. E. Enenkel and P. J. Smith), pp. 427–455 (Brill, Leiden, 2007).
At the dawn of the seventeenth century, other European mercantile enterprises, with their goal of pursuing trade with India, arrived on Madagascar via the inner passage to India, through the Mozambique Channel. The English East India Company (EIC) was founded 31 December 1600. James Lancaster, who led the first English expedition to India via the Cape of Good Hope in October 1591, commanded the EIC’s first expedition on the flagship Red Dragon. They embarked 13 February 1601 with a course to Indonesia and landed at Antongil Bay, on the eastern coast of Madagascar, on 24 December, owing to the number of crew with scurvy. The third voyage of the EIC, commanded by William Keeling, departed in the spring of 1607. William Hawkins captained the Hector, and carried papers from James I to formally establish relations with the Mughal Emperor, Jahangir (1569–1627), and set up a Company Factory at Surat. They anchored at St Augustine Bay, on the southwest coast of Madagascar on 18 February 1608. William Finch, a London merchant employed by the EIC, and travelling with Hawkins, provides the first official English description of lemurs in his journal:

In the woods neere about the River, is a great store of beasts, as big as Munkies, ash-colored, with a small head, long tail like a Fox, garled with white and blacke, the furre very fine. Wee killed some with Peeces, not being able to take them alive.

He clearly refers to ring-tailed lemurs, not only by the description, but also by the location, both geographically and ecologically. The area around St Augustine Bay is within the modern range of Lemur catta (southern and southwestern Madagascar). The tamarind tree (Tamarindus indica) is a keystone food source for some populations of ring-tailed lemurs, and grows in riverine forests such as Finch describes.

The destination of the lemurs killed by the crew is unknown. Robert Cecil, 1st Earl of Salisbury (1563–1612), for the purpose of obtaining animals for the king, gave orders to the commanders of the third voyage to procure them. Therefore, it is important to note the intent to capture live specimens.

Hawkins was unsuccessful in securing a permanent firman, a royal decree to establish trading rights and protections, from Jahangir. This was not achieved until the tenth voyage of the EIC when Thomas Best, commanding the Red Dragon, established the permanent factory in Surat and defeated the Portuguese in the Battle of Swally in 1612. This was the headquarters for the EIC trade in India until 1687.

The earliest known description of a lemur in captivity comes from the Jahangirnama, the memoirs of Jahangir, who reigned from 1605 to 1627. He possessed a menagerie of exotic animals, a keen eye for observation, and a desire to document these animals in both written descriptions and graphic representations. He ordered curiosities to be purchased from Goa ‘without consideration of cost’. There, a lemur (whose description matches closely that of

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21 J. Sibree, ‘First voyage of the English East India Company, in 1601, under the command of Captain James Lancaster’, Antananarivo Annu. Madagascar Mag., p. 10 (1889); S. Purchas, Hakluytus Posthumus or Purchas his pilgrimes, vol. 1 (AMS Press, New York, 1965).

22 S. Purchas, Hakluytus posthumus, or, Purchas his Pilgrimes: containing a history of the world in sea voyages and lande travels by Englishmen and others, nos 14–30 (James MacLehose & Sons, Glasgow, 1905), p. 11.

23 A. S. Mertl-Millhollen, K. Blumenfeld-Jones, S. M. Raharison, D. R. Tsaramanana and H. Rasaminmanana, ‘Tamarind tree seed dispersal by ring-tailed lemurs’, Primates 52, 391–396 (2011).

24 C. Grigson, Menagerie: the history of exotic animals in England 1000–1837 (Oxford University Press, Oxford, 2016).

25 J. M. Campbell, ‘History of Gujarát’, in Gazetteer of the Bombay Presidency (1896), vol. I (1896), pt 1.
a male *Eulemur mongoz*; figure 3) was acquired and subsequently described in an entry from 25 March 1612.\textsuperscript{26}

He also brought a simian of a strange and curious shape. Its hands, feet, ears, and head are exactly like a monkey’s, but its face resembles a fox’s. The colour of its eyes is like a hawk’s, but its eyes are larger than a hawk’s. It is an ordinary cubit from its head to the base of its tail, shorter than a monkey but longer than a fox. Its fur is like the wool of a sheep, and it is gray. From its earlobe to its chin is a wine-colored red. Its tail is longer than a half cubit and three fingers. Unlike other monkeys this one’s tail hangs down like a cat’s. Sometimes it makes a noise like the cry of an antelope fawn. All in all it was extremely strange.

Jahangir ordered the production of a likeness, but whether or not the lemur was in fact depicted is unknown. An image of a turkey acquired concurrently resides in the collection of the Victoria and Albert Museum of London.

\textsuperscript{26} W. M. Thackston (ed.), *The Jahangirnama: memoirs of Jahangir, Emperor of India* (Freer Gallery of Art, Washington, DC, 1999), pp. 133–134. Available from: Smithsonian Libraries, https://library.si.edu/digital-library/book/jahangirnamamemo00jaha.
Peter Mundy travelled the world under the employ of the EIC in the mid-seventeenth century.\textsuperscript{27} His journal remained an unpublished manuscript at the Bodleian Library until Sir Richard Carnac, under the auspices the Hakluyt Society, did so in five volumes in the early twentieth century. Mundy provided the second and third descriptions of lemurs in captivity, but was the first English source to detail the human-mediated spread of lemurs from Madagascar. He first landed at St Augustine Bay in July 1628,\textsuperscript{28} but ten years later, in 1638, while travelling on the East Indiaman \textit{Sunne} (Sun), Mundy wintered in Madagascar after hitting storms while heading towards the Cape from Mauritius:\textsuperscript{29}

Divers other creatures, etts., came to our sight, as Bugeeas, like unto Monkyes in hands and Feete, butt sharpe snowted like a Fox, soft, Downy haired and somwhatt bushy, long tailed, which when hee sits hee brings over all, a Dull creature, having seene one att Suratt [Factory] house (brought From hence).

While the early description of a lemur on Madagascar is important, Mundy demonstrates the movement of lemurs by the EIC along the trade route to Surat. Later, in 1655, he details one aboard a ship after being acquired on ‘Johanna’ (Anjouan) in the Comoros in the Mozambique Channel:\textsuperscript{30}

Here are munkeies and another animal called by us a bugee (which in Italian signifies a monkey). It hath a sharpe muzzell, a very long taile, a very soft and thicke furre, the hinder part of his body much higher then the forepart. It had the foremost toe of the hinder feets unproport-ionable bigg like thumbs. It was exceeding nimble that it would skip from rope to rope, topmast staies and uppermost lines of the ship, with such agilitie that it seemed rather to fly then leape. And soe famigliar to every one that hee would leap on their shoulders, take then fast about the next and licke their mouthes and faces. It died on the way homeward.

The \textit{Alleppo Merchant} left the Comoros for Surat on 22 August 1655. The exact point at which Mundy would consider the journey to be ‘homeward’ is uncertain, but they passed the Cape of Good Hope nearly a year later, in May. This would indicate that the lemur lived the better part of a year on the \textit{Alleppo Merchant}, throughout its business in India.

His drawing of ‘a Bugee, a pretti animal’ is the first known depiction of a lemur in captivity to survive (figure 4) and is ‘unquestionably \textit{Lemur [Eulemur] mongoz}’, as they are the only wild species of lemur on Anjouan.\textsuperscript{31} Mundy incorrectly ascribes an Italian etymology to ‘bugee’, as \textit{bugio} is Portuguese for the howler monkey. This might demonstrate the lasting legacy of the Portuguese role in the history of lemurs in Madagascar and beyond. While bugee did not stand the test of time, \textit{macaco} (Portuguese for monkey) certainly did.

A year after Mundy’s bugee died on the homeward journey to England, another lemur survived. We know this from the diaries of John Evelyn (1620–1706, FRS 1663). In addition to Jahangir’s turkey, the Victoria and Albert Museum also possesses a cabinet

\textsuperscript{27} Temple, L. C. S. R. C. (ed.), \textit{The travels of Peter Mundy, in Europe and Asia, 1608–1667}, vols I–V (Taylor & Francis, London, 2017).

\textsuperscript{28} P. Mundy, \textit{The travels of Peter Mundy, in Europe and Asia, 1608–1667}, vol. II: \textit{Travels in Asia, 1628–1634} (Ashgate Publishing Company, Farnham, 2010).

\textsuperscript{29} Mundy, P. \textit{The travels of Peter Mundy, in Europe and Asia, 1608–1667}, vol. III: \textit{Travels in England, India, China, Etc.} (printed for the Hakluyt Society, London, 2010), p. 393.

\textsuperscript{30} Mundy, P. \textit{The travels of Peter Mundy in Europe and Asia, 1608–1667}, vol. 5: \textit{Travels in south-west England and western India, with a diary of events in London 1658–1663, and in Penryn, 1664–1667} (Hakluyt Society, London, 1936), p. 45.

\textsuperscript{31} Tattersall, \textit{op. cit.} (note 3).
Figure 4. ‘A Bugge, a pretti animal’ by Peter Mundy, August 1655 in Mundy, P. The travels of Peter Mundy in Europe and Asia, 1608–1667, vol. 5: Travels in south-west England and western India, with a diary of events in London 1658–1663, and in Penryn, 1664–1667 (Hakluyt Society, London, 1936), p. 45.
thought to have once housed these diaries. Evelyn was a contemporary and friend of the other notable seventeenth century diarist, Samuel Pepys. Evelyn’s diaries covered the period from 1640 to 1706. Peppered throughout the more historically important entries regarding the English Civil War and Restoration are descriptions of aviaries and menageries. His diary entry on 18 June 1657 (which follows the two-sentence entry regarding the birth of his son, George) describes the earliest known documentation of a lemur in England:

At Greenwich I saw a sort of catt brought from the East Indies, shaped and snouted much like the Egyptian racoon, in ye body like a monkey, and so footed; the ears and taile like a catt, onely the taile much longer, and the skin variously ringed with black and white; with the taile it wound up its body like a serpent, and so got up into trees, and with it would wrap its whole body round. Its haire was woolly like a lamb; it was exceedingly nimble, gentle, and purr’d as dos ye catt.

Evelyn would be instrumental in the founding of the Royal Society and was elected an original Fellow. Robert Hooke (1635–1703, FRS 1663), another original Fellow, lists in a diary entry from August 1672 a collection of animal curiosities he witnessed. These included a cassowary and an ‘India catt’. Although using similar language to describe the animal, Hooke’s ‘catt’ cannot be definitively characterized. Evelyn, however, most certainly described a ring-tailed lemur living in London a little over 90 years before the animal later described by Edwards.

Although the Verenigde Oost-Indische Compagnie (VOC) was founded in 1602, the first Dutch ship to land on Madagascar was in 1595. The first expedition around the Cape stopped to bury sailors who died from scurvy. Much like the Portuguese, the Dutch generally avoided Madagascar, focusing the bulk of their trade eastward, establishing their capital in Batavia (modern Jakarta). The island mainly served as refuge for ships caught leaving Asia for the Cape too late in the season, and there were specific regulations for VOC routes (seylaesorder) outlined in 1616/7 by the Heren XVII that forbade routes to Indonesia via Madagascar. However, like their other European counterparts, the Dutch continued to exploit the people of Madagascar as slave labour throughout their African and Asian colonies. The VOC made 12 trips to Madagascar in the second half of the seventeenth century to acquire slaves.

In 1682, the papers of Johan Nieuhof (1618–1672) were published posthumously (coincidentally, he died on Madagascar in 1672 while on his return voyage to Holland). He was commissioned by the VOC to document his travels. Within his writings from

32 William Bray. *Memoirs of John Evelyn, comprising his diary, from 1641 to 1705–6, and a selection of his familiar letters. To which is subjoined, the private correspondence between Charles I. and sir E. Nicholas; also between sir E. Hyde and sir R. Browne* (Oxford University, 1827), p. 122.
33 City of London, *Robert Hooke diary*, https://www.cityoflondon.gov.uk/things-to-do/history-and-heritage/london-metropolitan-archives/collections/robert-hooke-diary.
34 J. C. De Villiers, ‘The Dutch East India Company, scurvy and the victualling station at the Cape: history of medicine’, *S. Afr. Med. J.* 96, 105–109 (2006).
35 J. R. Bruijn, ‘Between Batavia and the Cape: shipping patterns of the Dutch East India Company’, *J. Southeast Asian Stud.* 11, 251–265 (1980).
36 M. Vink, ‘“The World’s Oldest Trade”: Dutch slavery and slave trade in the Indian Ocean in the seventeenth century’, *J. World Hist.* 14, 131–177 (2003).
37 J. Nieuhof, *Gedenkweerdige Brasiliaense zee-en lantreize, behelzende al het geen op dezelve is voorgevallen, beneffens een bondige beschrijving van gantsch Neerlants Brasil …* (Jacob van Meurs, Amsterdam, 1682), pp. 293–294.
1662, he describes some of the wildlife he encountered in what is now Indonesia. The ‘Macassar Vos’ was one of these animals:

The Macassar Fox has got his name from the Isle of Macassar, where he is most found. He has an excessive [sic] long bushy tail, which stands upright, flat feet, long claws, and short ears.

The written description obviously has elements pointing away from a lemur, chiefly, the long claws and habitat in Makassar, South Sulawesi. However, the general appearance of the depiction, and the gripping opposable thumb of the left hand, are more convincing for the ‘vos’ being rather, a lemur (figure 5). Sulawesi does not have a native fox nor any other mammals that match the illustrated form. Thomas Pennant (1726–1798, FRS 1767) in his *Synopsis of Quadrupeds* (1771) and Johann Erxleben (1744–1777) in his *Systema Regna Animalis* (1777) state that the Nieuhof’s ‘Macassar fox’ was synonymous with what is now *Eulemur mongoz*. Erxleben lists the Celebes as part of its habitat outside of Madagascar. In 1676, nearly 67% of Makassar’s population were slaves. Aside from the general trade

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38 T. Pennant, *Synopsis of Quadrupeds* (J. Monk, Chester, 1771); J. C. P. Erxleben, *Systema Regni Animalis per classes, ordines, genera, species, varietates, cum synonymia et historia animalium: classis I. Mammalia* (Impensis Weygandianis, Leipzig, 1777).
routes bringing lemurs to Indonesia as they did to India, the slave-trading routes might have been a potential direct source for the presence of lemurs in Makassar.

PART III: TRACING THE BUGEÉ (1693–1732)

Towards the end of the seventeenth century and into the eighteenth century, lemurs outside of Madagascar were documented as part of larger attempts to record and classify the natural world. John Ray (1627–1705, FRS 1667) published Synopsis Methodica Animalium Quadrupedem et Serpentini Generis in 1693. He provides a description of Cercopithecus Indicus Bugeé dictus from an animal seen by Dr Tancred Robinson (1657–1748, FRS 1684) a year earlier in London on the Strand: ‘Castorem capite, pilo, magnitudine proximè referebat: Cauda & pedes diversi. Rarum esse Animal etiam in India’ [The size of a beaver, and has the head and hair like that animal; but the tail and feet are different. A rare animal in India.]. With this description alone, it would not be possible to definitively state that Robinson, as stated by Ray, saw a lemur in central London in 1692. Ian Tattersall, in The primates of Madagascar (1982), was of the opinion that this was likely not a lemur, stating, ‘[the application of it to the epithet ‘Bugeé’ may have originated in confusion arising from the fact that Indiamen quite frequently called at Madagascar’. Mundy’s manuscript was unpublished at this time, and therefore likely unknown to both Ray and Robinson. The use of bugée here is independent, and consequently important to labelling the animal a lemur. No other mammal during the time-period was described in the literature by that moniker. If one looks at the larger circle of colleagues, correspondents and collaborators of these two men, there is additional evidence to support the conclusion that it was a lemur.

James Petiver (1663–1718, FRS 1695) was an apothecary in London and frequently mentioned in Ray’s published correspondence. In his Gazophylacii Naturae & Artis (1703), Petiver describes a Simia Sciurus lanuginosus fuscus as a Cercopithecus Indicus Bugée dictus from the island of ‘Joanna’ (Anjouan):

The wool of this is brown, soft and curled like that of a Lamb, it has several properties of a squirrel, sitting often upright when it eats, which generally is done by his incisors, and reflecting his bushy tail. This strange creature is now alive (viz. May 1703.) at Mr. Dottins a druggist, who had him 12 months since from Joanna.

The islands of Anjouan, Mohéli, and Mayotte in the Comoro archipelago are the only locations outside of Madagascar where lemurs are considered native, having been introduced by humans several hundred years ago. Two species, Eulemur mongoz and

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39 J. Ray, Synopsis Methodica Animalium Quadrupedem et Serpentini Generis: vulgarium notas characteristicas, rariorum descriptiones integras exhibens: cum historiis & observationibus anatomicis perquam curiosis: praemittuntur nonnulla De animalium in genere, sensu, generatione, divisione, &c (S. Smith & B. Walford, London, 1693), p. 158.
40 Tattersall, op. cit. (note 3), p. 7.
41 J. Ray, The correspondence of John Ray: consisting of selections from the philosophical letters published by Dr. Derham, and original letters of John Ray in the collection of the British Museum (The Ray Society, London, 1848).
42 J. Petiver, Jacobi Petiveri Opera, historiam naturalem spectantia: containing several thousand figures of birds, beasts, fish, reptiles, insects, shells, corals, and fossils; also of trees, shrubs, herbs, fruits, fungus’s, mosses, sea-weeds, & c. from all parts, adapted to Ray’s History of plants, on above three hundred copper-plates, with english and latin names. The shells have English, Latin, and native names. NB Above one hundred of these plates were never published before. To which are now added seventeen ..., vol. 1 (John Millan, London, 1767), p. 4.
43 J. Pastorini, U. Thalmann and R. D. Martin, ‘A molecular approach to comparative phylogeography of extant Malagasy lemurs’, Proc. Natl Acad. Sci. USA 100, 5879–5884 (2003).
Eulemur fulvus, are found there, with the former being present on Anjouan. William Cowper (1666–1709, FRS 1699), the artist, author and anatomist, depicted the lemur in *Gazophylacii* (figure 6).

This lemur was of some repute, as John Barbot, a slave-trader, in his *A Description of the Coasts of North and South-Guinea* (1732), later described it (figure 7):44

... a rare creature about as big as a little monkey, which I often saw in the possession of Mr. Geo. d’Otin, drugster in Newgate-Street, London, about the year 1703, who kept it in his shop, and was presented with it by a traveller coming from the island of Angouan [sic], one of the Comeras [sic] ... This little animal’s head was like that of a very young lamb, only the muzzle somewhat sharper-pointed; the ears flat and open, the head and neck all cover’d with a short curl’d wool as fine as silk; the body, legs, and tail exactly as a monkey, only that the tail was more hairy. The noise it made was like a swine, and play’d all the tricks of a monkey. The wool on its head, neck and body, was grey and brown striped. It fed very greedily on walnuts, and was very full of sport, but died in 1704. The same sort of animal is also found in the island of Madagascar, and call’d Chitote by the people about the bay of Massaly, facing the channel of Mozambique.

Barbot identified what is now the known range of the mongoose lemur (Massaly is the modern city of Mahajanga) on the northwest coat of Madagascar, across from the

44 J. Barbot, *A Description of the Coasts of North and South-Guinea; and of Ethiopia Inferior, Vulgarly Angola* (A. & J. Churchill, London, 1732), p. 260.
Comoros. ‘Chitote’ is not a published Malagasy term for a lemur, so the accuracy is spurious. However, this lemur provides excellent context to the state of captivity at that time—it was acquired from a voyager, purchased as a novelty, and rare enough to warrant mention decades after its death. Both depictions also provide some detail on the captive diet, as a walnut is featured prominently.

Sir Hans Sloane (1660–1753, FRS 1685) was also in Ray’s circle. He was physician to three successive monarchs, and succeeded Sir Isaac Newton as president of the Royal Society. Early in his career, he was physician to the Governor of Jamaica. As a result of his time and experiences on the island, he published two volumes on the subject, wherein he catalogued the flora and fauna. In the second (1725), he noted that the animal described by Ray and Petiver was ‘frequently brought hither by Ships from the Island of Joanna, and other Parts’. Whereas lemurs in Jamaica seem unlikely, Madagascar was a source of slaves for the West Indies from the 1670s to 1698. Despite the voyage from the New World to Madagascar and back taking well over a year, the loss in time was outweighed by the profits, as slaves from Madagascar cost around ten shillings versus the West African

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45 J. Razafindramanana, T. M. Eppley, R. Rakotondrahe, D. Roulet, M. Irwin and T. King, ‘Eulemur mongoz’ The IUCN Red List of Threatened Species, 2020. e.T8202A115561431 (https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T8202A115561431.en).
46 H. Sloane, A Voyage to the Islands Madera, Barbados, Nieuw, S. Christophers and Jamaica, with the Natural History… of Those Islands, vol. 2 (printed by B.M. for the author, London, 1725).
rate of three to four pounds. As lemurs travelled northeast to India and east to Indonesia as a result of the trade routes, both commercial and slave, they also made their way to Jamaica.

Sloane commissioned the Dutch artist Everhard Kick to illustrate the work, and states in the introduction to the second edition that most of the illustrations were produced prior to the printing of the first volume in 1707. ‘A bugee’ by Kick is in the collection of the British Museum (figure 8). Sloane bequeathed his personal collection (which included Petiver’s as well, purchased after his death) to the British nation. From this material, the British Museum was created.

Kick’s illustration, and probably more importantly, its caption, ties together the circle of Ray, Petiver and Sloane. However, it is still problematic from an identification perspective. Although this is the oldest known depiction of a lemur in colour, the coloration throughout its body is inconsistent with any particular species (see illustrations in Mittermeier et al.48). It is, however, identifiable as a *Eulemur*.

A final piece of contextual evidence that Ray’s Cercopithecus Indicus Bugee dictus indeed represented a lemur is an advertisement published on 17 September 1717 in *The Post Man and The Historical Account*. In it, Michael Bland, at the ‘Leopard and Tyger at Tower Dock near Tower Hill’ in London, offered a ‘Buggee from Madagascar’ for sale among other rarities, including monkeys and exotic birds.49 Bland’s buggee, if the one reproduced for Sloane was made prior to 1707, was the last reference we could identify calling lemurs by some variation of that name. There is no clear indication as to why this delineation ceases between approximately 1720 and the tenth edition of *Systema*.

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47 A. Bialuszkewski, ‘Pirates, slavers, and the indigenous population in Madagascar, c. 1690–1715’, *Int. J. Afr. Hist. Stud.* 38, 401–425 (2005); V. Platt, ‘The East India Company and the Madagascar slave trade’, *William Mary Q.* 26, 548–577 (1969).

48 R. A. Mittermeier, I. Tattersall, W. R. Konstant, D. M. Meyers and R. B. Mast. *Lemurs of Madagascar* (Conservation International, Washington, DC, 1994).

49 Michael Bland. *The Post Man and The Historical Account* (London, 17 September 1717), p. 2.
PART IV: THE CHAINED LEMUR (1732–1761)

‘In a domestic state, the prodigious rapidity of their movements renders them incommodious: it is for this reason alone that they are generally chained; for, though extremely active and vivacious, they are neither mischievous nor ferocious. They tame to such a degree as to go out and return, without any danger of running off.’

Royal and aristocratic menageries existed over the centuries both as a means of demonstrating dominion over the natural world by acclimatizing foreign creatures, establishing the far-reaching scope of empires, and for diplomacy through gift exchange. In the eighteenth century, the confluence of expanded access due to the progression of East Indian trade and more disposable wealth available for luxury goods not only allowed these menageries to flourish, but also gave the merchant class access to these exotic animals. Although sparse in the seventeenth century, documented lemurs outside Madagascar therefore saw a noticeable increase in the first half of the eighteenth century.

The Netherlands

Although Linnaeus credited Edwards’s depiction of the ‘Macauco’ for the type specimen, there were at least two other depictions of *Lemur catta* produced earlier in Europe. The earliest known representation is currently in the collection of the Rijksmuseum in Amsterdam. Produced in 1741 in The Hague by Cornelis Troost (1696–1750), the painting ‘De Spilpenning of de verkwistende vrouw’ clearly demonstrates a living subject, as it appears to be playing with lace. The left forearm has a dark spot indicative of an antebraehial gland. This is only prominent in male ring-tailed lemurs, and used for scent marking. On close inspection, there is a belt around its waist connected to a chain (figure 9).

Germany

In 1748, the same year as Edwards’s lemur’s arrival in England from Madagascar and 10 years prior to his publication of *A Natural History of Birds*, Johann Elias Ridinger (1698–1767) sketched a living *Lemur catta*. As with Troost’s, there appears to be the suggestion of a belt around the lemur’s waist (figure 10).

In the collection of the Albertina Museum in Vienna, the sketch is labelled as Cebus capite Vulpino (Füchsel maennigen). This nomenclature was used three years later (1751) in Jacob Klein’s (1685–1758, FRS 1729) *Quadrupedum Dispositio Brevique Historia Naturalis*, and cited as synonymous with ‘the Macauco’ by Edwards.

Austria

Prince Eugene of Savoy (1663–1736) had a menagerie in his Lower Belvedere estate in Vienna, which was completed in 1716. Salomon Kleiner (1700–1761), in 1732, made a

50 G. L. Le Clerc, *Natural History, General and Particular ... Translated, ... with Notes and Observations by W. Smellie*, vol. 7 (W. Strahan & T. Cadell, London, 1791), pp. 225–226.

51 P. Sahlins, ‘The royal menageries of Louis XIV and the civilizing process revisited’. *French Hist. Stud.* 35(2), 237–267 (2012); F. Egmond, ‘Precious nature. Rare naturalia as collector’s items and gifts in Early Modern Europe. Luxury in the Low Countries’, in *Miscellaneous reflections on Netherlandish material culture*, 1500 (ed. R. C. Rittersma), pp. 47–65 (Pharo Publishing, Brussels, 2010); C. Plumb, Exotic animals in eighteenth-century Britain, PhD thesis, University of Manchester (2010).

52 Plumb, op. cit. (note 51).

53 J. T. Klein, *Quadrupedum dispositio brevisque historia naturalis* (Bernhard Christoph Breitkopfium, Leipzig, 1751).
series of engravings of the animals, plants and other objects found within the menagerie. Although labelled as ‘Indianische Füchse [Indian Foxes]’, along with a coati, the animal represented was clearly a primate (figure 11). Leopold Fitzinger, an Austrian zoologist, in Versuch einer Geschichte der Menagerien des österreichisch-kaiserlichen Hofes (1853), labels the animal ‘auf einer Mauer sitzend’ as a Lemur [Eulemur] albifrons.

Also in Vienna, the imperial menagerie of Schönbrunn was built in 1752 by Francis I (1708–1765), the Holy Roman Emperor, with a design inspired, in part, by that of the menagerie at Belvedere. With his death, the empress, Marie Theresa (1717–1780), redecorated the Rococo octagonal pavilion, built in 1759, as a memorial. It displays twelve large animal portraits produced by Johann Michael Purgau. One of these portraits depicts a ring-tailed lemur eating grapes. Based on the pose, it was likely from life. Although the image post-dates Linnaeus’s Lemur catta by a few years, given the importance of the

54. L. J. Fitzinger, Versuch einer Geschichte der Menagerien des österreichisch-kaiserlichen Hofes mit besonderer Berücksichtigung der Menagerie zu Schönbrunn nebst einer Aufzählung der in denselben gehaltenen Thiere von der ältesten bis auf die neueste Zeit (Braumüller, Vienna, 1853), p. 323.
55. G. Loisel, Histoire des ménageries de l’antiquité à nos jours (Doin, Paris, 1912).
56. Schönbrunn Zoo, ‘The zoo: from menagerie to zoological garden’ (https://www.schoenbrunn.at/en/about-schoenbrunn/gardens/tour-through-the-park/zoo).
Figure 10. ‘Cebus capite Vulpino’, by Johann Elias Ridinger (1748), Inv. 3904, in the Albertina Museum, Vienna (https://sammlungenonline.albertina.at/#/query/ec94bde3-9200-4c57-b598-0cc22e9f40ac) (accessed 1 June 2021). (Online version in colour.)
Tiergarten Schönbrunn as the oldest zoological park in continuous use, having a ring-tailed lemur as one of the earliest occupants is notable for our account (figure 12).

France

There is a long and complicated history between France and Madagascar. The French intermittently sent ships to Madagascar in the early part of the seventeenth century. Cardinal Richelieu founded the Compagnie de l’Orient in 1642, and in the following year, Fort Dauphin was established on the southern coast. Named for Louis XIV, who ascended to the throne the same year, the French colony was eventually abandoned by the mid 1670s. Etienne de Flacourt, the second governor (from 1648 to 1655), published an account in 1658, which provided some of the earliest European depictions of lemurs on Madagascar.57 There are not, however, known French sources of lemurs outside of Madagascar until the mid-eighteenth century.

The menagerie at Louis XIV’s Versailles housed its first animals in 1664. Gustave Loisel, in his Histoire des ménageries de l’antiquité à nos jours,58 attempted to catalogue the animals kept at Versailles using a variety of sources, including accounts from animal suppliers, paintings, drawings and engravings, as well as historical accounts. Among the animals, he lists ‘maki rouge’ (likely Varecia rubra) with the period name ‘singe’. Unfortunately, Loisel’s exact source for this is not specifically stated, and therefore the date for this possible captive lemur in France cannot be confirmed. The menagerie was active until

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57 J. Kay, ‘Etienne de Flacourt, l’histoire de le Grand Ile de Madagascar (1658)’. Curtis’s Bot. Mag. 21, 251–257 (2004).
58 Loisel, op. cit. (note 55).
1794, when the last of the animals were moved to Paris into the recently renamed Jardin des Plantes (from Jardin du Roi, currently the Paris Zoo, the second-oldest zoological park in continuous use) in revolutionary France. It is therefore possible that it post-dates Linnaeus.

Georges-Louis Leclerc, Comte de Buffon (1707–1788, FRS 1740), directed the Jardin du Roi from 1739 until his death. Established as a botanical garden for medicinal plants in 1626, the Jardin, under Buffon, transitioned to the study of natural history.59 His Histoire naturelle, générale et particulière, published in 36 volumes between 1749 and 1788, provided a narrative history of the animals, and in doing so, was meant to contrast with prior catalogues such as Systema Naturae.60 His collaborator for the first 15 volumes, Louis-Jean-Marie Daubenton (1716–1800, FRS 1755), provided a description of an anatomical dissection and a listing of the specimens held in the Cabinet du Roi. The thirteenth volume, published in 1765, includes three lemurs, or ‘makis’, described as ‘le mocock ou Mococo’, ‘le mongous’, and ‘le vari’.

The original pen-and-ink drawings for the illustrations by Jacques de Sève (1742–1788) are in the collection of the Bibliothèque nationale de France (figure 13). They differ from the published prints in that they have handwritten dates. The ring-tailed lemur was drawn in 1755, the mongoose lemur in 1759, and the black-and-white ruffed lemur (Varecia variegata) in 1757, pre-dating the tenth edition Systema Naturae. This meant that Buffon

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59 A. Guerrini, ‘Perrault, Buffon and the natural history of animals’, Notes Rec. R. Soc. 66, 393–409 (2012).
60 J. Loveland, ‘Another Daubenton, another Histoire naturelle’, J. Hist. Biol. 39, 457–491 (2006).
and Daubenton had the opportunity to publish prior to Linnaeus. The opportunity to publish ‘first’ was lost because Buffon chose to publish from an anthropocentric viewpoint—species that were domesticated and most useful to mankind were prioritized and exotic species came in later volumes. Whether sketched from life or taxidermy specimens is not explicitly stated, but the positioning of ‘le Mongous’ appears the most life-like of the three. Prepared
specimens of particular internal organs were also depicted, indicating a higher likelihood for living lemurs reaching Paris. However, Daubenton also worked from preserved specimens when the animals were rare.

Buffon’s observations on ‘le Mococo’ (ring-tailed lemur) in captivity that introduce this section cannot be dated explicitly to an animal that was in France prior to Linnaeus; however, he clearly delineates when his ‘mongous’ lived:61

I had a mongous in my possession of several years, which was altogether brown. It had yellow eyes, a black nose, and short ears. It amused itself with eating its own tail, and actually destroyed the last four or five vertebrae. This animal was extremely dirty, and so troublesome that we were obliged to chain him. Whenever he could make his escape, he went into the neighbouring shops in quest of fruits, sugar, and sweetmeats, and opened the boxes which contained them. It was difficult to seize him, and he bit cruelly even those with whom he was best acquainted … He was fed with bread and fruits … the cold of the winter 1750 killed him.

While described as a ‘mongous’, based on the depiction by de Sève, although clearly a *Eulemur*, it was not *Eulemur mongoz*. The image seems more in line with a male *Eulemur rufus* (red brown lemur).

If Buffon wanted to describe a history of an animal beyond its classification, he certainly accomplished that here. His lemur self-mutilated, was often chained, and lived off of a non-natural diet of human food both intentionally and unintentionally. However, he had no opportunity to describe the natural habits and diet of this animal, because they were completely unknown to him. Therefore, the captive state was the ‘histoire naturelle’. As Buffon’s series was one of the most popular in Europe in the eighteenth and nineteenth centuries, this portrayal of a lemur’s behaviours in captivity was the introduction for most to the species.

Mathurin Jacques Brisson (1723–1806) published *Regnum Animale* in 1756 based on the collection of René Antoine Ferchault de Réaumur (1683–1757, FRS 1738). Brisson managed the collection for the last eight years of Réaumur’s life. He includes four lemurs: Prosimia fusca (with three varieties: Le Maki, Le Maki aux pieds blancs, and Le Maki aux pieds fauves) and Prosimia cinerea (Le Maki a queue annelée),62 described from prepared specimens. Their origins are unknown, and are therefore only included as the last pre-Linnaean classification.

**England**

Auctioned by Sotheby’s twice (in 1974 and 2017), *Lemurs a scarlet macaw, a red-billed parrot and a cockatoo, in an exotic landscape* (figure 14) has had two attributions—in the manner of Jacob Bogdani and the circle of Tobias Stranover. Both were Baroque animalier, from Hungary and Transylvania respectively, working in London in the first half of the eighteenth century. Stranover married Bogdani’s daughter. Although there is no direct attribution to an individual artist, the date range places it within the period of interest, with Stranover dying in 1756. The assemblage of animals appears not collectively painted from life, but, based on the individual poses, the animals, particularly the mongoose lemurs, were certainly living individuals.

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61 G.-L. L. de Buffon, Comte de Buffon *Buffon’s natural history* (from the French with notes by the translator), vol. 8 (Books on Demand, 2020), p. 163.
62 M. J. Brisson, *Animal Regnum in classes IX distributum* (Cl. Joannem-Baptistam Bauche, Paris, 1756), pp. 220–222.
The Taylor White (1701–1772, FRS 1725) Collection, comprising 938 watercolours of birds, mammals, fish and reptiles, is housed within the Special Collections of McGill University. He commissioned the works as a ‘paper museum’ of natural history. There are four lemurs in the collection. The Eulemur macaco, depicted by Peter Paillou (figure 15), is noted as a ‘monkey from the collection of the Duke of Cumberland’. Prince William Augustus, Duke of Cumberland (1721–1765, FRS 1760), established a royal menagerie at Windsor Great Park after his appointment as Ranger in 1746. Although no date is provided, it likely pre-dates George Edwards’s ‘Black Maucauco’ for two reasons: the use of ‘monkey’, and the fact that Taylor White was both a patron and supplier of subjects to Edwards. Three of White’s birds are depicted in A Natural History and two in Gleanings. Therefore, White would know Edwards’s work.

There is also an undated Varecia variegata by Paillou (figure 16), accompanied by the following notes from White:

Primates Cercopithicus [Cercopithecus]
Albo Nigroque variegatus
Cercopithicus [Cercopithecus] cunocephalus [cynocephalus] corpore albo facie pedibus caudaq[ue] nigris. maculis nigris in humeris & genibus notatus. auribus comosis albis nasone elongata.

63 Collection MSG BW002—Taylor White Collection, McGill Archival Collections Catalogue, https://archivalcollections.library.mcgill.ca/index.php/taylor-white-collection.
‘Mocauci’ is a Latinization of Edwards’s ‘Maucauco’. The other lemurs in the White collection—two ring-tailed lemurs and a mongoose lemur—are also undated, but their notes reference Linnaeus, Edwards, Brisson, and Johann Friederich Gronovius. With no
Figure 16. ‘The Black & White Monkey’ by Peter Paillou (ca 1720–ca 1790). Courtesy of the Taylor White Collection, Rare Books and Special Collections, McGill University Library, Montreal. (Online version in colour.)
reference to ‘Lemur’ or to Buffon’s ‘Vari’ specifically, and especially in view of the popularity of *Histoire naturelle*, it is reasonable to place this watercolour prior to both, but following Edwards’s *A Natural History*. This would make it the earliest known likeness of a black-and-white ruffed lemur (*Varecia variegata*).
The last example, although technically post-dating the *Lemur catta* published in the tenth edition, is nearly contemporaneous, produced in 1761. It is included not only because of the quality of the depiction, but also as an example of the spread of lemurs eastward to China. This painting (figure 17), in the collection of the Taipei National Museum, depicts a Guórán (果然) from Jiāozhī (交趾, modern Vietnam). Presented as a gift to the Qianlong Emperor (1711–1799) from the King of Vietnam, this ring-tailed lemur was painted on a hanging scroll by Giuseppe Castiglione (1688–1766). Castiglione, given the name Lang Shih-ning, was a Jesuit painter who worked in the Beijing court of three successive Qing Dynasty emperors, Kangxi, Yongzheng and Qianlong.

The Portuguese, Dutch, British and French all participated in trade with Vietnam as part of the inter-Asian and East Indian trade routes. The ring-tailed lemur made its way from Madagascar to Vietnam and subsequently to Beijing, almost certainly, as a consequence. The quality of the depiction is such that one can see the antebrachial gland on the lemur’s forearm and the possible loss of the distal portion of the tail. Tail loss was previously discussed with Buffon’s lemur, and self-injurious behaviours are known in captive prosimians. For captive lemurs outside of Madagascar, frostbite injury to the tail has also been described.

**CONCLUSION**

Throughout this review, we have attempted an exhaustive account of the lemurs depicted outside Madagascar prior to formal descriptions by Linnaeus, expanding (with a specific focus) the seminal historical backgrounds by Buettner-Janusch *et al.* and Tattersall. This would not be possible without the digitization of books, records and collections and their availability on websites, including the Biodiversity Heritage Library and Google Books. There are certainly other early examples of captive lemurs yet to be included in this story. We were limited by records accessible online and where translations were available or performed reasonably. ‘Misidentification’ of lemurs as other types of animals in the time before the genus *Lemur* was widely known (e.g. the potential use of *bugio* in period Portuguese documentation), and use of terminology that would not immediately indicate a lemur, are additional issues. On those occasions when a historical misidentification likely occurred, the visual representation of that animal was essential for elucidating the error.

The importance of captive specimens in the nascent period of modern zoology cannot be overstated. The expansion of empires and international trade opened up the world for scientific exploration and allowed a better understanding of how previously unknown species fit into the grander scheme. Even the most sinister and despicable component of...
the system, the slave trade, played its role as well. Lemurs, by their uniqueness and geographic isolation, and Madagascar’s specific position along and part of these trade routes, serve as a model for understanding this period of transition. Additionally, the historical context is essential to understanding the lives of those animals and what captivity meant. The conditions of transport, diet and housing all speak to their health and wellbeing, and should be evaluated for these important early specimens, including those that served as ‘types’ and those that remain in museum collections today.

By 1766, the year of the publication of the twelfth edition of *Systema Naturae*, lemurs reached Sweden. In the years following the publication of the tenth and twelfth editions, Linnaeus himself possessed members of the genus he created in his menagerie in Uppsala. In 1769, he had a female mongoose lemur, and, by 1776, three black lemurs.70 The petite houses placed on top of poles, once used for small primates, can be seen by visitors to the Linnaeus Garden today.

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70 I. Svanberg, “”Deras mistande rör mig så hierteligen”- Linné och hans sällskapsdjur”, *Svenska Linnésällskapets Årsskrift* 2007, 11–108 (2007).