

CHAPTER XXXX

Donkeys and mules of the Indian Ocean: breeding and trade in the long nineteenth century, 1780s to 1918¹

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Introduction

Donkeys and their crosses around the Indian Ocean were overshadowed by more numerous and glamorous horses during the long nineteenth-century. (Clarence-Smith 2004a) And yet, donkeys and mules mattered economically, particularly in terms of transport. They were highly appreciated as pack animals in stony and steep landscapes, for both civilian and military purposes. They pulled an assortment of wagons, carts, and carriages, notably in arid regions. They were widely ridden, albeit rarely on the field of battle, as they were generally slower than horses. At times, donkeys and mules ploughed, threshed, pulled logs, and powered mining and proto-industrial operations. Their human keepers might exploit their milk, dung, hides, hoofs, bones and carcasses, and, more rarely, might eat their flesh. (Dent 1972; Bough 2011; Tobias and Morrison 2006)

Concentrated in the northwest quadrant of the Indian Ocean, breeders expanded their output from the late eighteenth century to 1918, but proved unable to meet all the needs stimulated by spreading trade and conquest. Regional breeders enjoyed the natural protection of distance, but they suffered from equine diseases, environmental disasters, scarce pastures, tariff barriers, and dysfunctional political and cultural structures. Indeed, some local breeders failed even to meet soaring internal demand for their animals. Moreover, military requirements for mules spiked suddenly and unpredictably during crises, making immediate availability more significant than price. At the same time, costs of importing from outside the region fell, as animals went by rail or river steamer to quaysides, where they were loaded onto ocean-going sailing ships, or, more rarely, steamers.

The spread of donkeys and mules around the Indian Ocean

Donkeys originated in northeastern Africa. DNA analysis indicates that domestication occurred around 5000 BCE, on the basis of two African species of wild ass, the Nubian and the Somali. There was no genetic contribution from wild Asian half-asses, even though donkeys soon crossed the Red Sea into the Middle East. (Beja-Pereira 2004)

The first deliberate crossing of donkey and horse may have occurred around 1000 BCE, somewhere in the Middle East, when domesticated horses had diffused southwards from the Eurasian steppe. (Dent 1972: 60-2, 66; Bough 2011: 70-3) The English word 'mule' generally refers to any of four different hybrids. Crossing a jack, a male donkey, with a mare, a female horse, engenders a mule in the proper sense. Sexually active but almost invariably sterile, mules can be either male or female. More rarely, a stallion, a male horse, is crossed with a jenny, a female donkey, to produce a hinny [or jennet], also sterile, and also male or female. (Savory 1979; Tegetmeier and Sutherland 1895: 123, 143, 146) Unless otherwise specified, 'mule' is used here for all four hybrids.

The subsequent spread of donkeys and mules around the Indian Ocean Basin was uneven, partly for natural reasons. As wild asses are creatures of the desert edge, they require careful breeding and management in humid and cold conditions. (Blench 2000: 24) Mules are climatically more tolerant, but most breeders stuck to mountainous terrain, less prone to disease. In tropical Africa, trypanosomes carried by tsetse flies proved to be the greatest barrier to equids. (Ford 1971) The only slightly less lethal *surra* [*Trypanosoma evansi*], spread by various blood-sucking flies, infested most of the Indian Ocean World.

(Clarence-Smith 2010; Hoare 1972) African Horse Sickness, a viral ailment transmitted by *Culicoides* midges, was enzootic in Central Africa, and broke out in occasional epizootic surges to the south and north, including parts of the Middle East. Both trypanosomes and African Horse Sickness affected donkeys and mules, albeit not quite as badly as horses. (Fielding and Krause 1998: 99; Wilkinson 2005: 196, 198; Tylden 1980: 85; Lamb 1974: 81)

Cultural attitudes further restricted the distribution of donkeys and mules, which were virtually absent from Southeast Asia, Japan, and Korea. (Clarence-Smith 2004a) There existed widespread prejudices against asses, especially in the Indic world. Moreover, crossing a base donkey with a noble horse was a heinous concept. (Kipling 1921: 76-83, 203; Dent 1972: 157) That said, such ideas failed to prevent the spread of donkeys and their crosses across most of South Asia and China.

It can be roughly estimated, with a fair bit of backward projection, that there were some 7 million donkeys, mules and hinnies in the Indian Ocean hinterland by 1910. Northeastern Africa contained about 2.5 million, mainly in Ethiopia and Egypt. (Mitchell 1998: Table C11) East and southern Africa weighed in at under a million, clustering in the Cape Province and northern East Africa. (South Africa 1922: V, 496; FAO 1947) The 'Indian Ocean Middle East' accounted for another 1.5 million or so, mostly situated in northwestern Persia and southern Kurdistan, the latter straddling Persia and Iraq. (McCarthy 1982: 295-6; Mitchell 1998: Table C11) British India sheltered some 2 million, concentrated in the upper stretches of the Indus Basin, and with significant numbers of donkeys on the Deccan Plateau. (*IGI* 1907-1909: III, 87-8, 101) Southeast Asia boasted no more than scattered imported mules, in the lands bordering on China and in the Philippines. (Clarence-Smith 2004a: 63-4; Clarence-Smith 2004b: 189, 197) Australia did not systematically collect numbers, which may have been around 0.05 million, competing with camels in arid zones of South Australia and Western Australia. (Australia 1959: 929; Bough 2011: 89-93)

Mules featured most prominently in long-distance trade, for they were valuable animals, which could only be produced with much patience and skill. As donkeys and horses displayed a strong natural antipathy to each other, mares that had lost their foals were coaxed into fostering newborn jacks, which grew up thinking of themselves as horses. Even then, considerable coercion might be required to control a mare being covered by a jack. Conception rates were low, and miscarriage rates high. A second set of jacks was often set aside to produce a new generation of donkeys, as jacks might not cover both mares and jennies. Uses had to be found for jacks not required for either kind of stud work. Indeed, the existence of supernumerary jennies may account for the persistence of hinny breeding. *Mulassières*, mares specialized in engendering mules, were frequently ill adapted to other tasks, and few stallions of this type were required, so that colts were castrated and sold off cheaply. (Dent 1972: 90-1; Savory 1979: 17, 21; Fielding and Krause 1998: 104; Knight 1902)

Commercial donkey breeding was far less common, as most donkeys were small, cheap, and easily propagated. Specialized breeding of donkeys for export thus tended to occur where horses were rare, and where producers raised expensive large white riding donkeys. (Vidal 1955: 171, 174, 186; Dent 1972: 127-31)

Donkeys for export in the Arab world

Large white riding donkeys, sometimes collectively known as 'Damascus asses,' were found in many parts of the Middle East. (Dent 1972: 127-8) Al-Hasa, a cluster of oases in eastern Arabia, may have been the original centre of dispersion. (Vidal 1955: 171, 174, 186; Great Britain 1916-1917: I, 301; Rihani 1930: 265) Crucial to the economic life of al-Hasa, where horses were rare, al-Hasa's donkeys were employed for riding, for pack on stony ground, to raise water for irrigation, and to thresh the rice crop. (Vidal 1955: 143-6, 154-5, 162, 171, 174) The Ottoman Empire, extending its control over al-Hasa from 1871, even mounted some of its troops on donkeys. (Anscombe 1997: 84, 212, n159) A related

animal was raised in central and western Arabia, and in the island of Bahrayn, from which they sometimes also took their name. (Great Britain 1920b: 72; Lorimer 1908-15: Appendix T, 10-11)

Al-Hasa long exported its celebrated donkeys, partly for breeding purposes. Within the Middle East, they went to Bahrayn, Persia, Basra, Baghdad, and Egypt. (Vidal 1955: 172; Floor 2003: 554; Ainsworth 1890: 194) From at least the eighteenth century, al-Hasa's donkeys were also sent in fair numbers to the lands of the southwestern Indian Ocean, transiting through the port of Muscat [Masqat] in Oman. (Landen 1967: 147; Barendse 2001: 30) Confusingly, they thus came to be known as 'Muscat asses', not only in the southwestern Indian Ocean region, but also in the Maghrib and the Sudan. (Mason 1969: 3; Zeuner 1963: 378; Haussner 2005:12-14) However, they were called Hassawi in Egypt, presumably reflecting their Gulf origins. (Mason 1969: 2)

Other Arab lands in the Indian Ocean region raised large white riding donkeys, notably Sennar [Sannâr], astride the Blue Nile. This centre of the old Funj sultanate was famed for its donkey, the largest in the country. (Mason 1969: 4) Sennar donkeys were exported overland to Ethiopia, in part to engender mules. (Simoons 1960: 130)

Donkeys bred for regional sale in East Africa

In East Africa proper, where horses were almost absent, the Maasai and related peoples raised the best donkeys in the 1850s, although they were considerably smaller than those imported from the Gulf. (Burton 1860: 216, 419) Maasai men were transhumant cattle pastoralists, for whom donkeys were a sideshow and a source of jokes, but Maasai women relied on their donkeys to fetch water and firewood, and for seasonal household moves. Some East African pastoralists milked their she-asses to fortify their children. The Maasai might sell donkeys to highland groups, such as the Kikuyu and the Kamba, who employed them pull carts, as well as eating them. In contrast, pastoralists did not partake of donkey meat. (Fernando and Starkey 2000: 32, 35, 37; Epstein 1971: II, 386-7; Spencer 1973: 14, 108; Marshall and Weissbrod 2009: 67, 71-2)

The Nyamwezi, living in what is now central Tanzania, had only recently taken to breeding donkeys in the 1850s, responding to rising demand from ivory caravans penetrating into the heart of Central Africa. The Nyamwezi sold roughly broken-in animals to passing Arab caravan leaders, or sent them down to the coast. Donkeys, whether ridden or laden, were a minor adjunct to head porters, and suffered much from disease, as well as from attacks by hyenas, leopards and crocodiles. (Burton 1860: 27, 49, 51, 62, 66, 73-5, 116, 128, 192, 203, 241, 299, 419, 439)

Other pockets of East Africa exported donkeys by land and sea. The coast and islands, partially free of tsetse, were adapted to breeding. (Hardinge 1928: 115) In 1809, the inhabitants of the Mossuril Peninsula, opposite Mozambique Island, not only produced 'Arabian' donkeys for pack, but also exported some to Brazil. (Salt 1816: 73) The Swahili of Lamu Island sent a few to neighbouring Kenyan islands, and to the great port of Mombasa. (Romero 1997: 118, 146) Similarly, Somalia exported a few hundred a year in the 1890s and 1900s. (Pankhurst 1968: 440-3; Chiesi 1909: 350)

Ethiopian mules: a highland product

The Ethiopian highlands were a great and ancient centre of mule production, which was largely in the hands of Eastern Orthodox Christians. At the end of the seventeenth century, Christians rode mules in preference to horses, and considered them to be emblems of political power. (Poncet 1709: 54, 58) At the end of the subsequent century, mules were the backbone of Ethiopia's transport system. (Bruce 1813: VI, 186) Indeed, Christian monks were enthusiastic breeders of these animals, as in the Debre Bizen monastery, in what is today Eritrea. (Pankhurst 1961: 196) The region of Lasta, to the south of the classical capital of Axum, was especially famous for its mules in the nineteenth century. (McCann 1995: 48; Wylde 1901: 349) Close by was Weldiya [Woldia], the greatest mule fair in the highlands. (Annaratone 1914: 440)

The turbulent Oromo [Galla] peoples to the south bred good mules, but remained much more partial to their fiery ponies. (Harris 1844: II, 424; Wylde 1901: 273-4; Simoons 1960: 129-30; Pankhurst 1968: 411) Jimma, a Muslim Oromo kingdom, marketed mules, and 'Wollo' is the name of a major Ethiopian mule type today. (Pankhurst 1968: 446; Haussner 2005: 54-5)

Other neighbours of the Ethiopian empire were not mule breeders. The Somali Muslim clans to the south and east only disposed of a few on trade routes into the highlands, probably obtained from Ethiopia. (Swayne 1900: 33-4) Arabic-speaking Muslims to the west, in the Nilotic Sudan, bred none themselves, while importing significant numbers from the Christian highlands. (Great Britain 1920c: 69)

Ethiopian mules were generally under 13 hands, but they could carry nearly 100 kilos, and were very frugal. A jack and a stallion would typically cover a mare alternately, and Ethiopians also engendered a few small hinnies. (Wylde 1901: 275-6) White mules were those most esteemed in the 1810s, possibly corresponding to today's 'Sennar' mules. (Pearce 1831: I, 313; Haussner 2005: 54-5) In the western highlands, long-legged and graceful Sennar jacks from the Sudan produced the best mules. (Simoons 1960: 130) Over time, the Sennar jack's reputation for producing good mules probably led to its being bred in Ethiopia itself. (Faye 1990: 33; Lemma 2004: 10)

Mules were one of early modern Ethiopia's five main export commodities. (Pankhurst 1961: 358) In the early 1810s, such mules were available for purchase at Massawa, on the Red Sea coast. (Milburn 1813: 83) Forty years later, mules were among the main products sent from Harar to the Somali port of Berbera. (Burton 1856: 338, 343) In the nineteenth century, some mules went overland to neighbouring countries, together with a few donkeys, while others went by sea from Eritrea or Somalia. (Pankhurst 1968: 352-68, 411-13; Hughes 2006: 85)

Middle Eastern mules: a pastoral speciality

Few mules were produced in Arabic-speaking lands in the Middle East, for Arabs held the horse in 'affection and high esteem', and thus disliked crossing it with the lowly ass. (Twitchell 1947: 22-3) Some Arabs even considered breeding mules to be contrary to Islam. (Vidal 1955: 173) This probably sprung from a *hadith* of the Prophet discouraging the practice, although it could be balanced by passages in the Qur'ân praising mules. (Tlili 2012) More pragmatically, there was a shortage of horses in much of the Arabic-speaking zone, where the donkey was king. (Vidal 1955: 174) There were mules in the Hijaz, but they were probably imported. (Burckhardt 1993: 218, 386; Great Britain 1920b: 74)

Egypt was the main exception in the Arab-speaking world, for the country bred some fine mules, with the best jacks coming from Upper Egypt and Nubia. (Sonnini 1799: II, 30716; *EB 1902-03*: Mule) It is possible that Eastern Orthodox Christians [Copts] were the main producers, for they were reputed to possess the best donkeys. (Wilkinson 1843: I, 319)

The great mule breeders of the Middle East were non-Arab transhumant pastoralists, inhabiting the mountains to the north and east of the Gulf. (Floor 2003: 549-56; Dent 1972: 155-6) These mules were on the small side, but they were famous for their strength and endurance, able to carry up to 150 kilos for as far as 30 miles in a single day. (Ainsworth 1890: 191, 193-4; Curzon 1892: II, 508). Luri-speaking peoples of northwestern Persia were the foremost mule breeders, especially the Bakhtiari confederation, which kept numerous jacks and mares segregated from other animals for this purpose. (Curzon 1892: II, 509; Biddulph 1893: 407; Bishop 1891: II, 117) Southern Kurdistan, split between the Persian and Ottoman empires and centred on Kermanshah in Persia, specialized in horses, but also produced fine mules. (Bishop 1891: I, 118; Dent 1972: 156) Major retailing bazaars were to be found in Tehran, Shushter, Isfahan and Shiraz. (Bishop 1891: I, 185-6, & II, 117; Curzon 1892: II, 508; Biddulph 1893: 407; Lorimer 1908-15: App. T, 8-9) A terrible drought decimated Persia's livestock in 1869/72, and it took some time for breeders to recover. (Gilbar 1978: 357-9)

It is likely that Bakhtiari mule-breeding practices of the mid-twentieth century harked back to earlier times. Breeders chose a large donkey, who had been brought up by a mare since birth, and who had thus always lived as a horse. A mare in heat was brought to sloping land below the jack. She had to be immobilized by several men, as even docile mares rarely accepted being covered by a jack. All male mules were castrated on reaching full physical development, at around three or four years of age. (Digard 1981: 42)

South Asian mules: under the aegis of the colonial state

The English East India Company, the hegemon of the subcontinent from the late eighteenth century, was initially obsessed with supplies of horses rather than mules, but the introduction of modern mountain batteries caused a reappraisal. (Hughes 1973) Special guns, carried on the backs of mules in three pieces, were introduced by 1860. After the invention of the 'screw' or 'jointed' gun in 1879, which was dismantled into half a dozen components, it became possible to transport heavier and more lethal pieces on the backs of as many powerful mules. (Hughes 1973: 311-17; Tylden 1980: pp. 191-2, 202, Plates 38, 41; Kipling 1921: 204-6) The spread of machine-guns, from around the 1880s, further emphasized the need for mules. (Isemonger and Scott 1998: 163)

British India therefore witnessed a sustained state-directed development of mule breeding. In view of the earlier failure of the government stud at Pusa, in modern Bihar, the British promoted mule production from 1876 by purchasing jacks to cover mares of Indian owners for a small fee. (Tegetmeier and Sutherland 1895: 135-7; Hunter 1882: 412)

Efforts at developing mule breeding only succeeded in the northwest of British India, roughly corresponding to the modern Islamic state of Pakistan. In contrast, the mainly Hindu populations of Gujarat, Rajasthan and the Deccan stubbornly resisted official blandishments to produce mules, allegedly because of their 'caste prejudices.' (India 1892-1911: 1897-98, 28-9, 1898-99, 29) That said, high caste Hindu Khatri mule dealers in the Punjab did take to breeding mules, realizing how much money they could make. (Punjab 1909: Vol. 28A, 147) Conversely, Muslim Baluchi, today partitioned between Pakistan and Iran, disliked mules, preferring to stick to breeding horses. (India 1892-1911: 190001, 6)

The recurrent complaint was of insufficient local jacks of good quality. The veterinary and remount departments thus spent much time and money searching for suitable imports from the Middle East, Central Asia, Southern Europe, the United States, and even Somalia and China. Eventually, they came to the conclusion that imported jacks were not worth the cost. After the Horse and Mule-Breeding Committee had reported in 1901, officials concentrated on improving the Punjab jack. Attempts to brand local 'pony mares' as suitable *mulassières* met with fierce local resistance, and were quietly dropped in favour of giving away surplus army mares. Officials also suggested the privatisation of stud services, noting that Indian entrepreneurs were moving into the business. Indeed, the growing success of mules for non-military employment was striking, with some even being exported to Afghanistan, the recurrent nemesis of the British Raj. (India 1892-1911: *passim*; Punjab 1909: *passim*)

From 1901, conditions governing land grants in Punjabi 'canal colonies' were modified, to provide land to families that would breed 'horses and mules for the army.' In practice, however, few mules were bred. In the Jhelum colony, settled in 1902-1906, the emphasis was all on horses. In the Lower Bari Doab colony, settled from 1914, the government stopped mule-breeding altogether from 1917 to 1940, as it was proving too popular, interfering with the supply of horses as cavalry remounts. (Ali 1988: 23-32, 134-7, 143-4, 147-9, 151-3, 156-7)

From mules to zebrules and hinnies in settler Africa: a stuttering enterprise

Mule breeding in colonies of White settlement was more hesitant, although it began soon after the Dutch East India Company had established itself in Cape Town in 1652. Donkeys were landed there from 1656, and Jan van Riebeeck, the first commander, was

welcoming the birth of mules in December 1661. (Joubert 1995: 125; Skead 1980: 362-3) Simon van der Stel, the second commander, set off for Namaqualand in 1685 with 8 mules, 20 horses, and 289 oxen. (Waterhouse 1924: 303) That said, neither mules nor donkeys, many of the latter coming from the Portuguese colony of the Cape Verde Islands, were at all prominent for a century or so. (Joubert 1995: 125-6; 134)

A more sustained effort at breeding mules in the southwestern Cape became apparent in the late eighteenth century, to service agriculture. (Joubert 1995: 126, 134) The Malmesbury or Swartland area produced a 'somewhat light' mule,' an animal that was faster than oxen for agricultural purposes. (South Africa 1922: V, 495) Military demand led to further developments during the French Wars, presumably after the British had conquered the colony in 1795. (Dent 1972: 123-4) In the 1850s, 'Cape mules' rarely stood above 14 hands, and were considered to be of a 'lighter' type. (Palmer and Bradshaw 1959: lxvi-ii)

Attempts to produce more and larger mules were undermined by disease. The De Beers diamond company imported big Spanish and American jacks to 'improve' local mules, but a major epizootic of African Horse Sickness raged from the Cape to Central Africa in 1891-92. Although mules were less affected than horses, they still died in considerable numbers. (Wallace 1896: 316-19)

The morbidity and mortality of horses and mules drove programmes for domesticating zebras, and later cross-breeding them with donkeys. As early as 1689, the Dutch company was exhorting settlers to turn to Mountain zebras and quaggas. (Joubert 1995: 133-4) In 1833, a few Mountain zebras were 'mounted without any difficulty' in Cape Town. (Roberts 1972: 395) Some success was also reported with quaggas, but they became extinct early in the nineteenth century. (Beinart 2003: 68, 196) As numbers of Mountain zebras declined, Burchell's zebras became the focus of attention, and they were mated with jennies to produce 'zebrules.' (Tegetmeier and Sutherland 1895: 40-2, 51-9, 66-8, 143; Clutton-Brock 1992: 24, 49; Playne 1910-1911: 608) Experiments of this type extended into Southern Rhodesia [Zimbabwe]. (Watney 1975: 90) However, zebras turned out not to be entirely immune to African Horse Sickness. (Wallace 1896: 308)

White farmers in Kenya followed along similar lines from around 1900. They usually stressed horses, in line with the colony's aristocratic ethos, but raised donkeys as well. One farmer imported a large white 'Arabian' jack, to 'improve' local jennies, as a first step towards breeding hinnies. The famous Lord Delamere attempted to produce zebrules on his wide estates. (Playne and Gale 1908-09: 181, 231, 295-6, 325, 331-2, 334) Zebras were even sent to the experimental station at Hissar, in the Punjab, to mate with donkeys, but the resulting zebrules were a disappointment. (Ware 1961: 36; Hassels-Yates 1973: 71)

Quarantine measures prevented *surra* from Somalia from spreading into South Africa in 1904, and a partially effective serum for African Horse Sickness was developed in 1909, but the cumulative impact of stock disease and war led to the precocious adoption of the internal combustion engine. (Joubert 1995: 133; Hoare 1972: 560) Breeding programmes for mules and zebrules quickly became obsolete, and were largely forgotten.

Australian mules: a failed export drive

Australians also came late to breeding mules, but they had the advantages of a benign disease environment and wide pastures. Donkeys were introduced from 1793, but disappeared from the records, and only grew in numbers after a second importation in 1866, in parallel with camels from Afghanistan. They contributed especially to haulage and pack work, and eventually gave rise to large feral populations. (Bough 2006; Bough 2011: 87-9) 'Masqat' jacks covered mares to make mules of 12 to 14 hands, and larger Catalan and Kentucky sires were later imported, engendering mules of 14 to 15 hands. Some hinnies were produced, but mules were preferred. Donkeys and their crosses did well in areas too arid for horses, and they reigned supreme in the northwest, where they

were not affected by ‘Kimberley disease,’ fatal to horses. (Despeissis 1921: 38,116-20, 128-30; Bough 2011: 90-1) It was later discovered that horses died from ingesting a local shrub, the poisonous pea-bush *Crotalaria cunninghamii*, whereas donkeys were either resistant or averse to eating it. (Calaby 1980: 328; Bough 2006: 390)

Despite numerous natural advantages, Australia exported very few mules, in stark contrast to the dominant position that it acquired on the horse markets of the Indian Ocean. (Yarwood 1989; Clarence-Smith 2004a) Australians seem to have adopted negative stereotypes from the English, who saw donkeys as animals of the poor and the Irish. (Tegetmeier and Sutherland 1895: 114, and *passim*) Packers complained of a shortage of mules on the internal market in the late 1880s, with only three breeders known to exist in Queensland. At the time, much popular prejudice was expressed against these ‘brutes.’ (*Queenslander* 1888) A long period of drought from 1892 to 1902 also created pessimism as to the limits of breeding. (Hanson 1938: 127-8) The local press reflected a spurt of optimism after the Boer War of 1899-1902, marked by Indian military demand, rising prices, and imports of breeding jacks from Egypt, Syria, Spain and the USA. (*Advertiser* 1905; *Queenslander* 1906) However, this proved to be a straw fire.

Imports from beyond the Indian Ocean: the Americas, Europe, and China

Part of the problem for regional breeders was growing competition from global exporters. Growing numbers of mules were being traded by sea over long distances, predominantly on specially equipped sailing vessels. (Katic 1998) The experience was often traumatic for the animals, as described for a cargo of hapless South American mules unloaded in Cape Town in 1876. (Ballantyne 1879: 87-9) On one disastrous voyage in 1896, a *pampero* storm from the Andes resulted in 6 mules being crushed to death shortly after departure from Montevideo. The remaining 115 mules then perished when a fire broke out in the hold, on arrival at the mouth of the Amazon. (Gloaguen 2010)

The South American ‘mule belt’ was the steadiest external supplier for Indian Ocean markets. Thriving mule breeding on the Pampas, from Cordoba to the Atlantic Ocean, had become well-established under Iberian rule, with the Jesuits as important players till their expulsion in 1767. Markets lay inland, in the silver mines of the vice-royalty of Peru and the gold mines of central Brazil. (Cushner 1983) Overland exports resumed after the initial disruptions of independence, with Chilean mines and Brazilian coffee plantations as new destinations, until railways undermined sales around 1880. (Conti and Sica 2011; Klein 1990) At the same time, newly legal sea-borne exports to foreign destinations were directed mainly to the eastern Caribbean, the Brazilian Amazon, and the Indian Ocean. (Howat 2006; Katic 1998; Gloaguen 2010) South American mules were cheap, as they were the products of an extensive low-input pastoral system. Breeders accepted low birth rates, and made little effort to break mules in. (Parish 1852: 245-6, 248-9, 311-12; Hutchinson 1865: 170; Palmer and Bradshaw 1859: lxvi-ii) River Plate ports were also geographically well placed to sell in the southwestern Indian Ocean.

The United States came much later to raising mules, and their fine but costly animals had to travel much further to reach the Indian Ocean, where they mainly arrived in times of war. George Washington and other founding fathers encouraged a poorly developed sector from the 1780s, although the destructive Civil War of 1861-65 was a setback. Rearing mules then exploded, with Tennessee, Kentucky, and Missouri sending some 330,000 mules beyond their state lines in 1889 alone. Expertly bred, and fed on calcium-rich bluegrass pastures, these were probably the best mules in the world. (Knight 1902; Tegetmeier and Sutherland 1895: 117, 123, 145; Dent 1972: 104-8, 113-14; Bough 2011: 84-5, 111-12; McShane and Swart 2011: 218) Exports abroad were small prior to the Civil war, but grew fast thereafter, typically to service the military campaigns of the United States and Britain. (Smith 1925: 213-14)

Southern Europe’s role was different, centering on exports of costly jacks for stud purposes. By the second half of the nineteenth century, buyers from around the world were paying astronomical sums for jacks, especially those of Catalonia, the Balearics,

Andalusia, Poitou, Sicily, Malta, and Cyprus. Breeders in India, Australia and South Africa only took part in this purchasing frenzy to a limited degree. (Knight 1902: 46-53; India 1892-1911; Wallace 1896: 317; Bough 2011: 90-1) Those in Ethiopia and Persia stuck to their traditional jacks.

Some famous mules from Poitou, in southwestern France, were also exported to the Indian Ocean, but they were costly to buy and transport. ('Baudet du Poitou' n.d) Historical ties to French planters, together with tariff protection in French colonies, helped, but French mule exports to the Indian Ocean probably declined over the course of the long nineteenth century. (*BPP: passim*)

China supplied some mules to India, both overland and by sea. Shaanxi, eastern Gansu, Shandong and Manchuria produced some fine beasts, bred with large Kwanchung jacks and widely traded within China. (Teichman 1921: 91, 181; Epstein 1969: 113-15) Some of these mules were sent by sea to India towards the end of the period. (Alexander 1917: 3; Smith 1925: 213) The mules of eastern Tibet and Yunnan, were considerably smaller, albeit of good quality. (Teichman 1921: 91) Chinese Hui Muslims were the principal breeders in Yunnan, and their large trading caravans to Burma brought mules for sale there and in British India. (Clarence-Smith 2004b)

Plantation markets: from Zanzibar to the Mascarenes

Tropical estates around the world made a heavy use of mules in the nineteenth century, especially where the land was hilly. They typically worked imported animals to death quite quickly. Small tropical islands, lacking pasture and labour for breeding, were especially dependent on imports. Even Jamaica, which bred quite a few, could not meet its own voracious requirements for mules. (Shepherd 1991)

Donkeys played a significant, if neglected, role in the spectacular development of clove plantations on the African offshore islands of Zanzibar and Pemba. (Gilbert 2004: 89) Indeed, one of the richest South Asian magnates of Zanzibar, Sir Taria Topan, an Isma'ili, began his career on the islands by touring estates with a donkey, purchasing cloves. (Cooper 1977: 139) Donkeys were imported from Somalia and the Gulf, and the occasional mule arrived from Persia. (Guillain 1856-57: III, 306, 328, 351)

Much more significant as importers of donkeys and mules in the Indian Ocean were the twin Mascarene islands. The Île de France passed into British hands in 1814, reverting to its old Dutch name of Mauritius, and became a major producer of cane sugar. (Storey 1997) The Île Bourbon remained French, but changed its name to Réunion in 1848. Réunion's sugar economy boomed initially, but then stagnated, and even declined after the restriction of labour migration from India in 1882. (Caubet 1934: 404-5)

Donkeys and mules replaced both bovids and humans for many tasks. A few equids were already present in the Mascarenes in the late eighteenth century, and anti-slavery advocates called for more to be imported, to lessen the burden on slaves, prior to abolition, in 1834 in Mauritius and in 1848 in Réunion (Saint-Pierre 2002: 147; Theal 1897-1905: 478) Mules were occasionally employed to power cane mills on Réunion, although they were soon replaced by steam engines. (Caubet 1934: 403) Both oxen and mules brought cane to Réunion's mills in the 1850s. (Beaton 1860: II, 122) Mauritius' expanding sugar economy came to rest squarely on mules and donkeys, which had virtually superseded oxen for carting by the 1860s. (Palmer and Bradshaw 1859: lxvi-ii; Boyle 1867: 260) In part, this reflected the steady spread of 'macadamised' roads across the island. (Anderson 2000: 2, 45)

Death rates were high for imported equids, encouraging periodic attempts to cut import bills by breeding animals locally, for example on the high plains of Réunion. (Ravisi 1850: 12) However, such schemes met with little success. (Palmer and Bradshaw 1859: lxvi; Backhouse 1844: I, 46) At best, locally grown maize became the staple food of mules on Réunion. (Imhaus 1862: 10-11, 58)

Mules and donkeys were generally more numerous than horses in the Mascarenes, and more widely imported. (Martin 1839: 515; *SYB* 1907: 953) The French background of planters in both islands probably influenced this choice, as did relative resistance to equine diseases. Only at the very end of the long nineteenth century, as imports fell overall, did more horses than mules enter Mauritius. (Table 1) There were re-exports of equids from Mauritius to India and Australia, but on a small scale. (Martin 1839: 511; Blake 1956: 118-19, 127; Bough 2006: 390).

Table 1: Mauritius- average annual imports of mules and donkeys 1833-1913 (with gaps)

	Mules & Donkeys	Mu	D
183	1,040		
184	1,553		
185	n.a.	n.a.	
186		1,0	
187		2,0	
188		9	
189		9	
190		4	
191		1	388

Sources: British Parliamentary Papers, Mauritius Blue Books.

Donkeys were initially sourced from the Gulf, both to ride and to pull carts. (Backhouse 1844: I, 46) Those exported from Masqat, in Oman, to Mauritius in the early nineteenth century mainly originated in Bahrayn. (Landen 1967: 147) A few came from East Africa. The trade picked up in the late 1830s, after the ending of slavery in Mauritius, and averaged some 630 a year in the 1840s. (*BPP: passim*) In 1859, almost all donkeys entering Mauritius were registered as coming via Masqat, although some large white riding animals, standing at up to 14 hands, arrived from Bushire, on the Persian coast. Donkeys were no longer widely ridden by this time, but they pulled carts with surprisingly heavy loads. (Palmer and Bradshaw 1859: lxvi)

The Gulf also supplied a few mules to the Mascarenes, with Oman already recorded as shipping them to French planters in the eighteenth century. (Barendse 2001: 30) In the 1850s, Persian mules in Mauritius were on the small side, but much appreciated. (Palmer and Bradshaw 1859: lxvi-ii)

Ethiopia was a more substantial early source of mules for the Mascarenes. A French ship or two a year usually called at the Red Sea port of Massawa from the 1830s, taking 400 or so mules to Mauritius and Réunion per year up to the 1850s. Beasts purchased for \$15 in Massawa might be sold for \$160-200 in the Mascarenes, but risks and costs were considerable. The animals were already out of condition when embarked on the hot Eritrean coast, and thus prone to disease. Ships had to provide ventilation, water, fodder, and protection against injury from rolling and pitching. (Pankhurst 1968: 356, 368) Mauritius also received mules from the Somali coast, and there were rumours that this might be a cover for clandestine slave trading. (Fontrier 2003: 58, 76, 83, 88, 156) ‘Red Sea’ mules in Mauritius in the 1850s were small and light, but speedy, graceful and long-lived. (Palmer and Bradshaw 1859: lxvi-ii) The trade had withered away by the 1880s, as demand rose within Ethiopia, and for overland export to the Sudan and Kenya. (Pankhurst 1968: 353, 371-8, 437-8, 445; Great Britain 1920a: 81; Great Britain 1920c: 69, 152)

South Africa was another regional supplier of mules to the Mascarenes up to the 1850s. Numbers were usually small, but with sudden surges, possibly indicating re-exports of South American animals. The peak year recorded was 1844, when 244 were sent to Mauritius, and 6 to Réunion. (*BPP: passim*) In the 1850s, these ‘Cape mules’ were reported to be rather small and light, but they were well trained, and thus commanded a premium over those from South America. Cape mules were often employed to pull the

carriages of the wealthy in Mauritius. (Palmer and Bradshaw 1859: lxvi-ii)

France also exported mules to the Mascarenes, and not just to its own colony of Réunion, where tariffs favoured the metropolis until 1861. (Imhaus 1862: 10) British reports show some 500 mules a year entering Mauritius from France in the 1830s and 1840s. (*BPP: passim*) In 1859, these mules were all exported through Nantes. (Palmer and Bradshaw 1859: lxvi) This suggests that they came from Poitou, which listed Mauritius as one of its markets. (Baudet du Poitou n.d.)

From around the middle of the nineteenth century, South America became the main supplier of mules and donkeys to Mauritius. A few South American mules had already arrived in occasional years, with the first known shipment leaving Buenos Aires in 1829. (Howat 2006) One batch came from Brazil in 1833, but in following years they were recorded as coming from 'Rio de la Plata' or 'Buenos Ayres'. (*BPP: passim*) An influx of mules from Buenos Aires and Montevideo in the 1850s caused prices of donkeys and mules to fall sharply on the island. (Palmer and Bradshaw 1859: lxvi-ii) Argentina replaced Uruguay as the chief source of mules from the early 1890s, and Uruguay dropped out altogether in 1898. (Mauritius Blue Books: *passim*) However, it is likely that most mules were always bred in the Pampas of Argentina, and that the switch to Buenos Aires merely reflected improved security and harbour facilities.

Donkeys became less important than mules in the second half of the century, although small imports of 'Muscat asses' into Mauritius persisted. Donkeys also continued to reach the island from Zanzibar and India, and even from Argentina. (Mauritius Blue Books: *passim*)

Réunion depended almost entirely on mule imports from South America by the 1870s. (*EB 1875-89: XX, Réunion*) However, France raised protectionist tariffs from 1884, and placed the island inside the metropolitan tariff wall in 1892, causing overall imports from non-French territories to fall by a quarter by 1900. (Schéerer 1985: 80) This probably favoured French mules, and perhaps those from Algeria and Morocco. Rail undermined the market for equids in the Mascarenes, spreading in Réunion from around the 1860s. (Caubet 1934: 408; Schéerer 1985: 81-2) On Mauritius, light tramways were given a powerful boost by animal disease. From 1901 to 1903, the island experienced a devastating epizootic of *surra*, introduced from India, which killed both equids and bovines. Rather than financing fresh imports of mules and donkeys, the authorities provided substantial loans to planters to expand the light rail network, which replaced carts to an increasing degree. (Storey 1997: 95; Great Britain 1910: I, 10, 48-9)

Mining markets: Australia and South Africa

Mining economies made a great use of donkeys and mules, both for both extractive operations and transport, with an increasing emphasis on the latter, as mining became more mechanized. The two most affected Indian Ocean regions themselves bred these animals and exported mules, but their resources at times proved insufficient for their own needs.

Australia imported South American mules, with the country's first recorded imports of 20 animals coming from Chile in 1840, consigned to an agricultural company in southeastern Australia. (Bader 1974: 49-53) In 1853, the Patent Copper Company, exploiting mines in South Australia, imported more mules, which reached Port Wakefield after a 70-day voyage from Montevideo. Muleteers were brought separately from Chile. ('Passenger ships' 2001) From the 1870s, however, Australia appears to have become self-sufficient in mules. There were even exports on a small scale to India and South Africa around the turn of the century. (India 1892-1911: 1900-01, 6, and 1901-02, 5; *Advertiser* 1905)

South Africa made increasing use of mules and donkeys from the late eighteenth century, initially for the wheat farms of the southwestern Cape, and only later to service mines. (Joubert 1995: 126, 133-4) Cape Town received mules from Buenos Aires and

Montevideo, after independence from Spain had been proclaimed in 1810. (McShane and Swart 2011: 217; Howat 2006; Worden et al. 1998: 165) Surging demand for transport became the key factor, with donkeys and mules well adapted to the arid and semi-arid Karoo, in the western half of the country. (Wallace 1986: 316) The Namaqualand copper mines of the northwestern Cape, employed Cape carts pulled by ten mules to take the ore to the coast from 1846. A railway was built from 1869, but mules supplied some of the motive power on this line as late as 1896. (Smalberger 1975: 68, 98-100, 105, 109-10; Jowell and Folb 2004: 22-4, 46) Donkeys and mules usually pulled light vehicles in the Karoo, such as two-wheeled Cape carts, but teams of 20 or more donkeys were at times harnessed to pull wagons. (Wallace 1986: 316; Jacobs 2001: 490; Dent 1972: 123; Watney 1975: 90; Tylden 1980: 92-3; Joubert 1995: 126; Ballantyne 1879: 7-8; Jowell and Folb 2004: 25, 33, 71, 98) Encouraged by the example of missionaries, Africans increasingly adopted donkeys for small carts. (Jacobs 2001; Beinart 2003: 274)

South Africa's 'mineral revolution' marked the transition to net mule imports from the late 1860s. (Clarence-Smith 2004a: 54-5) Mules and donkeys were vital to early mining operations, especially in the west. The booming diamond diggings at Kimberley employed numerous mules, some of which plunged to their death as rickety roads between pits collapsed. Once the 'great pit' had formed, mules or horses powered the whims that raised the ore. (Williams 1902: 220-3, 231) In the northwestern Cape's asbestos mines, donkeys drove whims, walking clockwise to make drums rotate, and then reversing the motion. In many mines in the region, donkeys, together with some mules, pulled flatbed carriages on narrow-gauge rails with side-tipping detachable pans, known as 'cocopans.' (Hocking 1983: 1-3, 62, 81, 91, 98) Even in the gold mines of the Transvaal, pack donkeys moved ore in the early days. (Bough 2011: 104)

As mining operations became increasingly mechanized, transport considerations moved the fore. While ox-wagons moved most bulky and low-value freight, thousands of horses and mules powered a local 'coaching revolution,' connecting major towns in southern Africa with American vehicles, prior to the advent of the railway. While horses were faster, mules were more hardy and frugal, and required less management. (Joubert 1995: 134-6; Watney 1975: 90) Mules might also draw urban delivery vehicles. (Williams 1902: 661; Watney 1975: 90-1) Mules were further employed in forestry, and to pull a growing range of farm machinery, especially in the western Cape. (Joubert 1995: 134-6; Wallace 1986: 316) Donkeys powered water pumps in the arid northern Cape, and a statue was eventually erected to them in Upington, in recognition of their role. (Bough 2011: 104)

A crisis wracked South and Central Africa from the late 1890s, as Rinderpest, *lamsiekte*, and East Coast Fever ravaged cattle populations, and the Second Anglo-Boer War of 1899-1902 wiped out stupendous numbers of animals. (Dent 1972: 124; Hocking 1983: 52-4; Joubert 1995: 136) The spread of the rail network was no more than a palliative, as railheads had to be serviced. To keep the wheels turning on roads and tracks, operators of carts, wagons and coaches harnessed as many equids as they could lay their hands on. (Joubert 1995: 132; Watney 1975: 90-1) By 1911-14, imports of mules were running at a little over 2,500 a year. Just over 100 donkeys a year were also entering the country, probably for stud work. (South Africa 1922: 497) In the long-term, this boosted the use of cars, buses, and lorries, but it took a long time for the new vehicles to become fully operational. (Joubert 1995: 136-7)

Military markets

Mules, already toiling in the baggage train of armies, acquired a new strategic significance with the development of mountain and machine-guns. India was the largest regional market for military mules, which served all around the Indian Ocean and beyond, wherever the British deployed troops stationed in the subcontinent. (Akita 2011: 420-2) Efforts to render India self-sufficient in mules were stymied by high mortality rates, especially as it was customary to sell, kill or abandon animals taken overseas at the end of a campaign.

British India was thus forced to import military mules by sea. However, military agents could only secure 108 mules from South Africa to deal with the 'Indian Mutiny' of 1857-58. (Wallace 1896: 309-10; Yarwood 1989: 122-3) British officers were then sent on purchasing expeditions to Persia, but imports remained disappointing. (Lorimer 1908-15: App. T; Schneider 1990: 303-5; Lorini 1900: 190) The army then fell back on obtaining more expensive mules from the USA, Argentina and North China. (India 1892-1911: *passim*; Alexander 1917: 3; Smith 1925: 213; McShane and Swart 2011: 217; Daunt 1973: 297)

For some significant engagements, Britain drafted in numerous mules from elsewhere, notably for the ludicrously expensive campaign against Ethiopia in 1867-68. British consuls procured about 8,000 pack mules from Gibraltar to the Gulf, but these were the refuse of Mediterranean and Middle Eastern towns. They died like flies, and their muleteers deserted. The British soon had to replace them with Indian mules and muleteers. Mules were crucial to the success of the expedition, both in maintaining supply lines and in transporting the mountain guns that ensured British victory over precipitous mountain terrain. (Bates 1979: 105-6, 128-9, 142, 153, 215-16)

The Second Anglo-Boer War, from 1899 to 1902, sucked in the largest contingent of military mules, many of which perished in South Africa. A tenth of the £22 million that Britain spent on the war went on horses and mules, and casualties were extremely high, mainly due to British mismanagement. (Tylden 1980: 62; Yarwood 1989: 172) The United States furnished some 67,000 much appreciated mules, depleting internal stocks and sending prices up for a decade in the USA. (Tylden 1980: 69, 91; Savory 1979: 23; Smith 1925: 213-14; Knight 1902: 6) About 45,000 local mules were also pressed into service on the British side, and unknown numbers on the Boer side. (Bough 2011: 113) A small number arrived from Australia. (*Advertiser* 1905) In the two years 1902 to 1903, Argentina then dispatched a further 63,423 mules to South Africa, to restock the country after the conflict. (Hanson 1938: 127, n12)

Other powers resorted to mules in Indian Ocean warfare. It was even said that 'the mule had conquered Madagascar' in 1895. (Milhaud and Coll 2004: 61) The French employed 2,800 mules in this campaign, though it is unclear where they were from. (Paillard 1989: 181) Mules, both pack and artillery, also served the French in their conquest of northern Indochina from the 1870s, and at least some of these animals came from over the Chinese border in Yunnan. (Anon. 1932: 172-4; Anon. 1930: II, 230) The Americans brought numerous mules from the USA to expel the Spaniards and put down the Philippines revolution in 1898-1902. (Bevoise 1995: 162; Carpenter 1926: 203) Moreover, indigenous powers relied in part on mules to expand their own colonial empires in the region, for example Ethiopia, Persia, Afghanistan, and China.

The First World War marked the climax of these conflicts, causing immense mortality among animals as well as humans. Not only European mules, but also large numbers from North and South America perished on the Western Front. (Tylden 1980: 39-40) Indian mules were also decimated there, as well as in the tragically botched attempt to seize Gallipoli from the Ottomans. (Alexander 1917) South Africa sacrificed many mules and donkeys in German East Africa [Tanganyika]. Due to the ravages of disease, especially tsetse-borne trypanosomes, the campaign turned into an equine calamity. Of some 33,000 mules sent in January 1916, only 879 were still alive in October. Donkeys fared only marginally better, for 1,402 remained out of 24,000. (Tylden 1980: 62-3)

Conclusion

The upsurge in sales of mules and donkeys around the Indian Ocean during World War I proved to be the peak in the global trade, as the titanic conflict hastened the development of the internal combustion engine. However, this displacement was slower in the Indian Ocean than in advanced economies. Even in a relatively modernized country such as South Africa, numbers of mules continued to grow in the interwar years, whereas those of horses stagnated and fell. (Swart 2010: 147) In our own times, impoverished Ethiopia

remains one of the great bastions of mules and donkeys in the world. (Hausssner 2005)

Historical information is particularly sparse on the raising of donkeys. Even the history of breeding expensive large white riding animals remains extremely limited. As for cheap common donkeys, no official attention was paid to these humble animals, which seemed quite capable of getting on with propagating the species by themselves. It was not until feral herds came to be seen as a problem, most notably in Australia from the 1930s, that governments began to seek information about reproductive matters. (Bough 2011: 94-9)

Somewhat more is known about the breeding of mules, for this was a specialised and commercialised business. Moreover, it was one of increasing military significance, as the 'screw gun' was perfected for mountain batteries, and as machine-guns spread. Nevertheless, it is remarkable how little information is available in published sources on the actual mechanics of producing mules, as seen from the perspective of breeders themselves. In some cases, it is not even clear who were the producers of mules, let alone how they conducted their business, notably in Ethiopia, Egypt, and South Africa.

In terms of commerce, the movement of live animals is routinely left out of overviews and statistical tables, and mules and donkeys have received even less attention than horses and cattle. This is perplexing, as the mechanics of moving mules over long distances in sailing ships were quite complicated. (Katic 1998) Like slaves, about whom a great deal has been written from this perspective, it was a considerable challenge to keep animals alive and well on long ocean voyages. A particular conundrum is that mules and donkeys apparently continued to be transported by sailing vessels, long after steamers had become common, cheap, and reliable. It is true that the wind was free, but the greater security offered to live animals by steamers might have compensated for higher costs.

Yawning gaps thus remain in the story of donkeys and their crosses around the nineteenth-century Indian Ocean. This is not a problem of sources. Even published works, notably travel accounts, are replete with references to every kind of animal, often accompanied by pictures. It is more that historians have not considered the humble donkey and the mongrel and sterile mule and hinny to be worthy of serious attention. It is surely time for this attitude to change.

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NOTES

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