



Exotics for Entertainment: A Reconstruction of the Roman Exotic Beast Trade (First to Third Centuries AD)

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The exotic beast trade for public spectacles in the Roman provinces is fraught with gaps in the historical record concerning its organization and infrastructure. Much of the evidence regarding these aspects of the animal trade, dating from the first to third centuries AD, is purely from the benefactor's perspective. There remain several mentions of 'hunter troupes', such as the *Telegenii*, who provided trained beasts and *bestiarii* (hunters) for these local games. This indicates that there was an established network of traders who provided these services during the Roman Imperial period. However, little is known about how they functioned. This paper proposes the use of comparative techniques to comment on how these troupes captured, transported, trained and traded animals for public spectacles. This discussion will analyze other contemporary Empire-wide trade networks, like the grain and slave trades, in addition to those of other cultures that imported exotic animals. By analyzing trade networks and the subsequent challenges faced by other cultures that imported exotic beasts, it is possible to explore how the networks of the Roman beast trade functioned.



Introduction

Beast hunts were an integral part of the culture of public entertainment in the Roman Empire, both during the Republican and Imperial periods. Beast hunts not only provided the public with opportunities to admire exotic creatures from across Rome's expansive Empire; they were also a visual manifestation of Rome's civilizing power and ability to conquer the wilderness, facilitating the spread of Roman civilization. While what happened on the day of the event is well known, thanks to extensive ancient literary and artistic depictions, the organization of these popular spectacles is still obscure. Evidence remains for parts of the ancient organization, trade and transportation of these wild beasts. However, much is still unknown about how these animals were successfully moved on such a scale that afforded the regular presentation of these spectacles throughout the Roman period.

The analysis of the exotic beast trade in this article is split into two sections. The first half of this article establishes what is already known about the Roman exotic beast trade. This will illustrate that there were several different entities operating in the Roman Empire to facilitate the exotic beast trade. These entities range from the military being sent to capture animals and funnel them back to Rome, to local hunter troupes taking on a gladiatorial *lanista*-like role in North Africa. In the second half, a comparative approach is proposed to better understand how people during the Roman period may have sourced animals for their games, utilizing records of the nineteenth century trade in exotic animals. This time period has been selected due to the complete nature of the evidence with the capture, transportation and resale of animals recorded in depth by those involved in the various stages of the process. This stands in stark contrast to the Roman sources which, most of the time, only represent the final product of the process of capture, transportation and resale. The capturing of animals during the nineteenth century also made use of traditional methods of capture, often utilizing local knowledge and hunters for assistance, and did not use modern veterinary solutions to avoid transport-related injury and deaths. In order to understand more about the ramifications that these capture and transportation techniques had on the wildlife in question, modern veterinary knowledge is also consulted. This informs the likely impact of the techniques being used by both those in the Roman period and the nineteenth century. Further, understanding the physiological impacts of the ways in which exotic animals were moved can inform about the side effects, both positive and detrimental to the animal's health.

By using a comparative methodology to analyze the much better recorded nineteenth century trade in exotic animals for use in circuses, scientific studies and private menageries, it is possible to reconstruct an idea of the logistical challenges that were faced by those involved in the organization of these games during the Roman period

and the possible solutions they may have utilized. This can then be applied to what is known about the ancient beast trade and the related costs to illustrate how challenging and expensive it would have been to import these animals.

The Ancient Evidence for Organizing *Venationes*

During the Republican period, the transportation of wild animals for public spectacle appears to have been an informal process, with benefactors largely relying upon the use of political contacts (Epplert 2001a: 210). An indication of how beast hunts were organized during this period can be found in a series of letters concerning M. Caelius Rufus, written in 51 BC during Cicero's governorship of Cilicia in Asia Minor (Jennison 1937: 137). Rufus wrote to Cicero concerning the upcoming elections in Rome, in which he had hoped to secure the *curule aedileship* (Kyle 2007: 286–287). The repeated correspondence by Rufus demonstrates his efforts to encourage others to gather and provide beasts for his prospective games (Cicero, *Letters to Friends* 8.9.3). This is followed by a more insistent series of letters by Rufus in October and again in February, in which he claims that Cicero will be disgraced if he cannot provide leopards (Cicero, *Letters to Friends* 8.6.5, 8.8.10). Rufus' requests for beasts are sharply contrasted by Cicero's letter to Atticus criticizing Rufus and his request (Cicero, *Letters to Atticus* 5.21.5, 6.1.21). Not only does this exchange illustrate the informal nature of the capture and transport of wild animals for games during the Republic, but it also depicts how these requests acted as a burden on the provincial administration and its population (Jennison 1937: 140). Requests such as these required a significant amount of logistical manpower locally, not only to capture and maintain animals, but also to transport them to their final destination. However, this very well could have been an attractive system to governors who may have used this situation as an opportunity to hand out favours.

While the Republican evidence paints a picture of a beast trade based mostly upon political connections and informal methods of animal acquisition, evidence from the Imperial period illustrates the development of infrastructure based on a retail model. These changes likely occurred during the first century AD, when evidence for hosting public entertainment suggests that it became a more prolific part of political and provincial life. There were three main groups involved in capturing and providing animals for arena spectacles during the Imperial period. These were the military, retail middlemen and hunter troupes that appeared during the third century AD.

Military Hunters

Animal hunting was an integral part of some Roman soldiers' duties and training. The *Cestes* of Julius Africanus (14; Epplert 2001a: 211) recommends the capture of wild animals, lions in this case, as an effective military exercise. Soldiers are also

recorded as being sent to control local populations of wild animals that could interfere with agriculture. A papyrus from the late first or early second century AD records the fulfilment of a soldier's orders at the Wadi Fawakhir:

'Antonius Proculus to Valerianus. Write the note to say that from the month of Agrippina until now we have been hunting all species of wild animals and birds for a year under the orders of the prefects. We have given what we have caught to Cerealis and he sent them and all the equipment to you...' (Davies 1989: 193).

This letter reveals a lot about the nature of these regiments, which were deployed specifically for hunting animals. The explicit mention of 'all species of wild animals and birds' suggests that these animals were destined either for Imperial games back in Rome, or to be sold to local benefactors. A similar example can be found in a mid-fourth-century AD document, which records the request of a priest in the Fayum. The priest asks that the cavalry stationed nearby capture a herd of gazelles that were destroying crops (Bell et al. 1962: 44–46, n.6). Like the letter of Antonius Proculus, the use of the word 'capture' indicates their intended use in a beast hunt rather than as food (Epplert 2001a: 212).

Epigraphic evidence from the German frontier also presents evidence of specialized military hunters, specifically *ursarii* (Epplert 2001a: 214). An inscription from Cologne records the activity of these hunters. Set up by Legio I Minerva, it documents the capture of 50 bears over six months by the centurion Tarquitiu Restutus Pisauro: 'Tarquitiu Restutus Pisauro of legio I Minerva documents the capture of fifty bears in a six-month period' (CIL XIII, 8174). Tarquitiu was likely sent these orders in recognition of his skill at capturing bears alive, not only to relieve the local population of an immediate danger, but also to ensure that these beasts were available for use in the arena. What is particularly notable about this inscription is the specific number of bears caught. Other examples of such military missions do not specify exact numbers or even species in some cases. This may suggest that Pisauro exceeded the requested quota of captured bears for the six-month mission, which would have been a point of pride for him and his fellow hunters (Epplert 2001a: 214–215).

A Potential Retail Model

A second potential source for acquiring animals was a more conventional retail option, targeted at the Italian elite who hosted animal spectacles. Ostia acted as a central Italian hub for receiving and purchasing animals (Meiggs 1960: 287; Scullard 1974: 253; Rea 2001: 267; MacKinnon 2006: 150; Sparreboom 2016: 68–69; Azaza and Colominas 2020: 6–7). It can be assumed that similar offices would have been situated in other

major commercial hubs throughout the Empire, and there are records of various exotic animals being shipped into major port cities.¹ Pliny's *Natural History* (36.4.40) tells of how a sculptor, Pasiteles, wanted to model his work from live specimens. Pasiteles is said to have gone to the docks where he could approach stacked cages of African animals that were waiting to be transported to their final destination. The story ends with the near-death of the sculptor as a panther escapes while Pasiteles is carefully examining another lion close by.

Mosaic evidence at Ostia also suggests that wild animals could be ordered from the port for use in games. The 'Sabratensium' elephant mosaic at the Piazza delle Corporazioni in Ostia is commonly interpreted as evidence of importers of ivory from the Sahara.² Sabratha is known to have been a hub for olive oil, ivory and the beast trade, acting as a coastal hub for trans-Saharan trade (Wilson 2002: 242). However, if this company had the facilities necessary to establish reliable trade between Sharan Africa and Ostia (hunters, over-land transport, ships, etc.) it would not have been a difficult transition to the transportation of live elephants across the Mediterranean. While more complex than transporting ivory, techniques for transporting other animals such as horses may have helped in this process. Further, the potential profits to be made from selling elephants along with ivory would have been significant. This is only one example of an animal business in the Piazza delle Corporazioni. Multiple similar storefront mosaics advertising businesses appear to have sold other common arena animals such as deer, boars and bulls.

Sodalités

The final method of obtaining animals for the games appears during the third century AD, in the form of epigraphic and mosaic evidence for several organizations that provided access to exotic animals and *bestiarii*, known today as *sodalités* (Beschaouch 1966). These entities appear to have operated similarly to how a *lanista* would provide gladiators for the games. While much of the evidence for these entities has been found in North Africa, epigraphic evidence from Noricum mentions a prominent local family called the *Albii* (*AE* 1998, 1011 and *CIL* III, 4738) who could have also been involved in the beast trade.³ North Africa remains, unsurprisingly, the most prolific region for evidence of these hunter troupes. These attestations, along with a plenitude of mosaic evidence depicting games with exotic animals, suggest not only that there was a significant demand for African beasts, but also that the region had an established means of supplying them to local benefactors at an affordable price. Troupes that have been identified in both mosaic and epigraphic corpora include the *Pentasioi*, the *Synematii*, the *Tauriscii*, and the most prevalent of them all, the *Telegenii* (Auguet 1972: 114).

While these hunter troupes were considerably involved in providing animals and hunters for the games, it is not entirely clear which parts of these activities they participated in. It can confidently be said that they were involved as ‘middlemen’ in the provision of beasts and hunters for *venationes*. This can be seen in the Magerius Mosaic at Smirat, which records the payment of the *Telegenii* (AE 1967, 549 = AE 2000, 1597 = AE 2007, 1684). The *Telegenii* are the central feature accompanied by four leather bags with the symbol ∞ (1,000) on them, suggesting that they were paid 1,000 *denarii* per leopard rather than the declared 500 *denarii* (Bomgardner 2009: 169). Particular attention has also been paid to the detailing of the leopards themselves. Each is specifically named: *Romanus* (‘Roman’), *Luxurius* (‘Luxuriant One’), *Crispinus* (‘Curly’) and *Victor* (‘Victor’). Additionally, garlands are tied around their midriffs. The inclusion of names and garlands suggests that these are not merely wild leopards brought to Smirat, but animals specially trained for the games. It has been suggested that animals raised in captivity would have been preferred as the roar of the arena crowd would have caused untrained animals to instinctually hide in the darkest place in the arena until they were either killed or forcibly driven from there (Bomgardner 2009: 168; Epplert 2016: 144–145). Further, the inclusion of the leopards’ names suggests that Magerius expected the viewers of this piece to recognize them, suggesting that they had been used in several games before this mosaic was commissioned. The documentation of tigers being captured as cubs rather than as adults, perhaps for the same reason, further illustrates that large felines were trained and were not killed after a single showing (Pliny the Elder, *Natural History* 8.25). This is reinforced in multiple visual depictions of tiger hunts throughout the Empire, such as the Worcester Hunt mosaic from Antioch (c. AD 500) and the hunting painting from the Tomb of Nasonii in Rome (Toynbee 1973: 72).⁴

The prolific presence of these companies is likely due to the popularity of these events within North Africa, for they do not appear anywhere else in the Empire. One unusual piece of evidence attesting to these hunter troupes is the mosaic with the ‘Fancy Dress Banquet’, found in Thysdrus and dating to the mid-third century AD (AE 1961, 66 = AE 2007, 1684). The scene depicts an amphitheatre with sleeping bulls surrounded by two figures speaking to the audience: ‘Silence, let the bulls sleep’. Sitting above is a fairly typical banquet scene of five figures, each speaking.⁵ Each audience member is accompanied by a symbol representative of a hunter troupe: a crescent moon on a staff, a millet stalk, a three-pointed crown with an S on it, a five-pointed crown and an ivy leaf. These are all emblems of established *sodalités*. Brand marks on the hindquarters of each of the bulls (a gladiator and a *sistrum*-like shape) suggest that they were not wild animals. Perhaps this scene is indicative of a custom held by these hunter troupes,

where animals for a *venatio* would be paraded and accompanied by a feast before the games. The millet stalks framing the scene may indicate the hunter troupe responsible for the bulls. The millet could represent five different *sodalités*: *Fangargi*, *Caprasii*, *Leontii*, *Barasii* and the *Lignii* (Sparreboom 2016). The only *sodalité* with the millet stalk emblem and the cipher four is the *Leontii*. Perhaps the scene depicts the festivities the night before a *venatio*, where bulls were provided and fought by the *Leontii*.

There is evidence to suggest that the *Telegenii* were also involved in the oil trade. Oil amphorae discovered at Ostia and Thaenae have seals matching the iconographical imagery of this hunter troupe (Bomgardner 2009: 170). Stamped onto the amphorae is a design bearing the number three, a number cipher that appears to have been associated with the group, with the middle figure depicting the characteristic crescent moon on a staff that can be seen on the Magerius Mosaic. These seals potentially suggest that the *Telegenii* were not only a thriving exotic beast trading company, but also had other trading interests in North Africa. This would explain why these companies depict evidence of providing animals for the games, but none for capturing animals in the wild. If this is the case, then it is possible that the *Telegenii* began their existence as staple commodity traders and possessed an established trading network, with ships available to transport these beasts. However, this evidence is not conclusive, instead, it is indicative of potential trade activity that could have facilitated the chain of supply around the Empire (MacKinnon 2006: 144; Bomgardner 2009: 170). Additionally, the mosaics found at the Villa of Sorothus (Sousse) suggest that the *Tauriscii* also had connections with several different forms of trade outside of the exotic beast hunt. Of particular note are the mosaics found in rooms A, B, C and E which all depict the animals accompanied by the emblem of the *Tauriscii* (ivy leaves). Rooms A, B and C each depict different exotic animals (panther, lion and boar respectively) (Laporte and Lavagne 2006: 1370–1376). Room E strangely associates the *Tauriscii* emblem with imagery of victorious horses for chariot racing (Laporte and Lavagne 2006: 1361–1367), notable as this is the only connection between a *sodalité* and chariot racing. It is unclear how Sorothus was connected to the *Tauriscii*, whether he was an avid fan of their performers, if he had business dealings with *sodalité*, or if he had a more direct hand in the operation of the hunter troupe. However, the mosaic of room C depicts Sorothus's stud farm (Laporte and Lavagne 2006: 1354–1361), along with the victorious racehorses, suggesting that he was also involved in the breeding and possibly training of racehorses. This association with other entertainment industries possibly indicates that Sorothus was also involved in the capture of exotic beasts for the amphitheatre. This is reinforced by Sorothus's further potential connection to maritime trade, as indicated by the repeated sea motifs of the Oecus mosaic (Laporte and Lavagne 2006:

1371). If this is the case, Sorothus may have been involved in the transportation of animals for the *Tauriscii* and potentially also bred racehorses to be raced in *Tauriscii*-related chariot racing.

It is clear that the *sodalités* were popular purveyors of beast hunts. African red slipware from El Aouja dating to the third century AD illustrates the popularity of these companies (Salomonson 1960: 51; Beschouch 1977: figs. 10 and 11). These vases depict *venatio* scenes with an inscription acclaiming that a particular *sodalité* emerges victorious: *Telegeni nika*, *Pentasi nika*, *Taurisici nika* and *Sinemati nika*.⁶ These jugs were likely a form of supporter paraphernalia that could be purchased during the games (Sparreboom 2016: 183). They suggest that these *sodalités* did not only provide a convenient way for North African organizers to source *venatores* and beasts for their games, but also accrued a following among the crowds for which they performed. Magerius expected viewers of this mosaic to recognize both the *Telegeni* and also specific hunters and leopards.

Sodalités also performed against each other, pitting the animals of one group against another's *venatores* (hunters). A mosaic discovered at the Algerian site of Castellum Tingitanum, displays three *venatores*: two fighting against a boar, and on the lower register, a third mounted hunter facing a leopard (Beschouch 2006: 1492–1498). In the foreground, in front of the boar are three stalks of millet, reminiscent of depictions of emblems and ciphers found in other artistic representations of *sodalités*. The millet recalls the emblem of the *leontii*, which shows a lion between two pairs of millet stalks. To the left of the two *venatores*, is a faint, but still recognizable yellow leaf with 'XV' alongside it. Beschouch (2006: 1496) identifies these *sodalités* as the *Caprasii* (emblem: millet stalks, cipher: three) and the *Mensurii* (emblem: leaf, cipher: fifteen).⁷ This mosaic acts in a similar way to the Magerius mosaic, commemorating a day of games in which the *Caprasii* provided animals and the *Mensurii* provided *venatores*.

Native Involvement

However, it is unknown where exactly these *sodalités* were involved in the supply chain of capturing animals for benefactors. There are no depictions directly linking the hunter troupes to the hunting of animals in the wild. It certainly would have been beneficial for *bestiarii* (beast-hunters) to be involved in the capture of wild animals to deepen their understanding and experience with these animals, which would have surely proven invaluable in the arena (MacKinnon 2006: 144). However, it is more likely that local huntsmen, such as those mentioned in Rufus' request for leopards (see the above section), were commissioned to capture animals that were supplied to hunter troupes for transportation to the games or training.

Native involvement in sourcing animals for Roman entertainment is referenced multiple times in the ancient literary evidence. Seneca the Younger (*De Brevitate Vitae* 13.6) reports that King Bocchus of Mauretania gave native spearmen for Sulla's games in 93 BC. Further, Pliny the Elder (*Natural History* 8.54.131) notes an event taking place in Rome in 61 BC where Numidian bears were matched with Ethiopian hunters. Plutarch (*Moralia* 972b) states that Juba also used hunters to dig pits to capture elephants. These hunters were presumably native huntsmen rather than soldiers, since a Roman military presence was not established in Mauretania until after Juba's death.⁸

Outside of specialized military hunters, troupes such as the *Telegenii* probably made use of a network of local huntsmen to procure their beasts. They provided a service to benefactors that made beast hunts much more accessible in the Imperial period. Acting as middlemen between local hunters and benefactors, they provided an avenue for reliably high-quality animals and hunters for the arena. Reliability of supply was a significant concern of many elites, hosting beast hunts with intentions to import exotic animals. Perhaps this is why there was such demand for professional troupes and suppliers of arena animals. The uncertainty of sea travel and the potential for setbacks or delays called for professionals who had an established network and reputation for providing not only a quality product but also a timely delivery.

Archaeozoological Evidence

The archaeozoological evidence also provides a sense of how animals were transported around the ancient Mediterranean. The archaeozoological corpus for exotic animals remains scarce and therefore cannot be taken as an absolute indicator of the presence of specific species throughout the Empire (Azaza and Colominas 2020: 4). Even in Rome, the archaeozoological evidence for arena animals is small in comparison to what is documented in literary records. However, skeletal remains found in the vicinity of the Colosseum illustrate how extensive the trade in exotic animals was during this period. The remains of around fifty large felines (lions, panthers, leopards, tigers) have been excavated from the sewers of the Colosseum and in the neighbouring areas (De Grossi Mazzorin 1995; De Grossi Mazzorin et al. 2005; De Grossi Mazzorin and Minniti 2019; Soranna 2019; De Grossi Mazzorin and Minniti 2023: 5). These animals were recorded as being primarily sourced from North Africa and Syria (Seneca, *Dialogues* 10; *Historia Augusta*, *Probus* 19; Pliny the Elder, *Natural History* 8.17.64–65; 8.26.96; *ILS*, 5055; Martial, *Epigrams* 2.7.8; *On the Spectacles* 21.18; Cassius Dio, *Roman History* 54.9.8). Bears are also highly represented in the Colosseum finds (De Grossi Mazzorin and Minniti 2023: 5) and are recorded as being sourced from Caledonia (Martial, *Epigrams* 7.8), Lucania (Martial, *Epigrams* 8), Dalmatia (Symmachus, *Letters* 7.121; 9.132 and 142),

the Targus region, and the Pyrenees (Claudian, *On Stilicho's Consulship* 3.309–313). Other animals discovered during Colosseum excavations include ostriches, hyenas and camels (Luzj 1894; De Grossi Mazzorin 1995).

The North African provinces that supplied many of these animals provide a limited record of remains. Known arena animals have been discovered at various Roman period North African sites. Elephants (Tuburbo Maius, northern Tunisia) and foxes (Bir Ennahal, north-eastern Tunisia) have been identified, but each of these finds represents only a single find across the whole Roman period (Azaza and Colominas 2020: table 2 and fig. 3). There are notable absences of premium arena animals such as the barbary lion, of which there has only been a single Iron Age discovery at the Zita archaeological site and none from the Roman period (Azaza and Colominas 2020: table 2). This scarcity could be explained as the result of the Roman exploitation of such animals and that such beasts were often exported out of the region before their death. However, this would not account for the significant overall scarcity of such remains throughout the Empire (Azaza and Colominas 2020: fig. 3). It has been theorized that this could be due to the disposal of animal carcasses that took place following the games, when animals associated with food stock (e.g., boar, deer, bulls and camels) were distributed to the populace as part of a public banquet (De Grossi Mazzorin et al. 2005: 339). The *Historia Augusta* (*The Three Gordians* 3.5–8; *Probus* 19.2–3) records this taking place in Rome where Gordian I and Probus are known to have distributed animals that participated in the games to the people. In cases where animals not typically associated with human consumption were killed, carcasses could have been repurposed as meat for live carnivores, with unusable parts disposed of, and valuable parts returned to the owner (De Grossi Mazzorin et al. 2005: 339).

The exotic animal that appears to have been the most widespread during this period is the camel. Around 70 sites have uncovered camel remains throughout the Roman Empire dating between the early first century AD and the fourth century AD (Dövenner et al. 2017). Remains of imported camels have been attested in Austria, Belgium, England, France, Germany, Hungary, Italy, Slovenia and Switzerland (Benecke 1994: 328; De Grossi Mazzorin 2006: 234; Velichkov 2009: 125; Pigière and Henrotay 2012; Tomczyk 2016: 1–13; Azaza and Colominas 2020: 6). Some of these finds have been discovered in an amphitheatre context, such as at Vindonissa in Switzerland (Schmid 1952–1953), Paris-Arenes de Lutece (Dierkens 2005), and Carthago Nova (modern Cartagena) (Morales Muñiz et al. 1995). The ancient sources attest to the use of camels for animal fighting (Cassius Dio, *Roman History* 60.7) and as part of races in the circus (Geoponika 16.22; *Historia Augusta*, *Elagabalus* 33.1; Suetonius, *Nero* 11.1). While the exotic nature of camels would make them an obvious choice for an arena or circus display in Europe, their multifaceted functionality in

daily life would have made them more accessible. Remains found during the Roman period demonstrated the wide variety of contexts in which these animals existed. Two come from amphitheatre contexts (Vindonissa (Switzerland) and Paris); five from military settlements (Abodiacum (modern Epfach), Vermania (modern Isny im Allgäu), Intercisa (modern Dunaujváros), Vindonissa, and Brisiacum (modern Breisach)); six from civilian contexts (the villas at Mauerbach, TÁC, Mercin et Vaux, and Plassac, additionally at the towns of Tours and Bordeaux); six from civilian sites located close to military contexts (Vindobona (modern Vienna), Augusta Vindelicum (modern Augsburg), Paris, Autun, Meaux, Arlon); a further find was found along the trade route of the Sarmatian site of Kampolt-Kister (northern Hungary) (Pigière and Henrotay 2012: 1536; Habinger et al. 2020: 81). Pliny the Elder (*Natural History*, 28.26) refers to the use of their brains, tails, and dung as medical or beauty treatments (Vuković-Bogdanović and Blažić 2014). Diodorus Siculus (2.54.6) makes reference to the use of their meat and milk (Potts 2004; for further historical uses of camel products, specifically fat, hair, wool and leather, see Köller-Rollefson 1991). This is confirmed by the discovery of butchering marks on camel bones found in Viminacium, in modern Serbia (Vuković-Bogdanović and Blažić 2014). Because of their accessibility, camels may have been hired out by traders passing through provincial cities as part of their games or as a source of additional income to those looking to dispose of animals that were no longer of use.

Nineteenth Century Exotic Animal Trade Networks

There is still much that is missing from the ancient record. This is a result of the evidence mainly being concerned with the event itself rather than how these animals made it to the games. Since most of the evidence for providing animals for the games is either focused on Rome or North Africa, it must be asked how the local elite in other provinces were able to acquire animals for their games. Did they go through a hunter troupe, similar to the *Telegenii*? Or did they simply opt for more local animals instead? Epigraphic evidence from Europe suggests that beast hunts were a common spectacle occurring alongside gladiatorial games; however, outside North Africa and Rome, the specific animals displayed at these games are rarely mentioned.⁹ As seen from the Ostia retail sellers and possibly from the presence of the *Telegenii* in other cities around the Roman Empire, there was certainly infrastructure in place to facilitate such trade. Finally, what challenges were faced in transporting these animals to their final destination? The fourth century AD letters of Symmachus (*Letters* 2.76.2) exclaim his outrage when the bears he had purchased were lost at sea, and then when a second group arrived malnourished and half-dead. Surely, this cannot have been a rare occurrence during the Roman period.

For this last point, it is possible to analyze how other cultures handled the issue of exotic animal trade to better understand the range of challenges that those during the Roman period may have faced when sourcing their own exotic animals. In contrast to the scarcity of records for the capture and transportation of animals in the Roman period, the nineteenth century hunter companies provide a well-recorded example of a multi-regional trade network in exotic beasts that were destined for sale in London, Liverpool, New York and Hamburg. While the nineteenth century is by no means the first time outside of the Greco-Roman period that exotic animals were tracked down in the wild to be displayed elsewhere, this period provides a unique insight into the challenges associated with sourcing and transporting due to its closeness historically. Unlike other periods, multiple diaries and biographies of notable hunter companies have been preserved, which give the modern historian a detailed insight into how such a business operated (Simons 2014: 26–27). While these animals were not being transported for the same reasons as the Roman trade, exotic animals were still sought out by the contemporary elite for display in circus acts, in private menageries and for scientific studies. However, what is consistent are the challenges faced by these companies in capturing and transporting these animals from the furthest corners of the world to countries like England and Germany. Each of these companies had several outposts that acted as regional hubs, where company agents would employ local hunters to track and capture animals to be brought back to Europe for display and finally purchase (Tait 2016: 79–80). The agents of the East London-based trader Charles Jamrach travelled the world in search of prized animals, one such example of this is the 1873 acquisition of four tapirs, two orangutans, a panther, an elephant, a bear, and ‘various large birds’ which were subsequently stored in the courtyard of the Hotel de la Paix in Singapore (Simons 2014: 38–39). He also employed local hunters in the area, in this case, the Fernandez brothers, who traversed the Malaysian Peninsula in search of potential purchases (Simons 2014: 38–39).

William C. Coup’s 1901 recount of Paul Tuhe’s time as a master hunter with the New York based Reiche Brothers illustrates the danger of capturing these wild animals, noting how several native huntsmen were killed when hunting elephants and that the capture of hippopotami was worse (26–29). There is a particular focus on trapping young animals as they are easier to capture, contain and transport. Tuhe notes that young animals would be captured because of their ability to acclimatize to their captors. This aligns with what is seen with the capture of animals such as tigers in the Roman world. Perhaps this is why there is a similar focus on younger animals in the Roman sources and may have been a technique used by the *sodalités* of North Africa who trained and presented a large number of exotic beasts. By taking young animals, they are not only easier to take back to a containment facility, but also can be trained

leading to a connection between captor and animal which would make these beasts more manageable in the arena long-term. Coup (1901: 26) even inserts his perspective on this before Tuhe's account, claiming:

'In capturing wild animals the rule is to kill the old ones and secure the young; for after any of the beasts have grown old enough to become accustomed to the free life of the forests, and to hunt their own food, they are treacherous and worth little for purposes of exhibition'.

Perhaps *venatores* (hunters) during the Roman period took a similar approach to the training of an animal, aiming to familiarize the animal with what would be expected of it in the arena. If this was the case, then the capture of fully grown animals in Antiquity was primarily intended for shows in which animals would be killed immediately.

Other than the use of trains and guns, these companies likely operated much in the same way as the Romans did for capturing and transporting these animals. From an economic perspective, it is immediately apparent that the transportation process was a costly and challenging part of this business. Josef Menges (1876) highlights this in his discussion of the differences in the prices for animals at Kassala in Africa and Europe, where he shows that in the most extreme case, the markup for purchasing animals in Europe appears to be at 7,500% (Table 1).¹⁰

Animal	Kassala (Eastern Sudan) Price	European Price
Elephant	80-400	3,000-6,000
Giraffe	80-200	2,000-3,000
Rhinoceros	160-400	6,000-12,000

Table 1: Prices for exotic animals in Kassala to their respective European costs (in marks) reported in Menges (1876): 232-233.

Menges explains that this price difference directly relates to the difficulties of moving these animals and the loss of life along the way. This is also reflected in William Coup's (1901: 19) writing where he notes that in New York he knew of a showman who paid \$10,000 for a single hippopotamus. One disastrous example of this is the record of Lorenzo Cassanova's 1869 expedition to Egypt and Ethiopia for the Hagenbeck company. The six-week journey overland to load the animals onto a steamship for transport to Trieste was a treacherous one and resulted in the loss of many animals: two elephants escaped and a further five were killed 'by accident' (Simons 2014: 39-40). Cassanova himself was stung by a poisonous fly and is said to have gone temporarily blind (Simons

2014: 39–40). Following a further train journey from Trieste to Hamburg, the resulting menagerie numbered 11 elephants, 5 giraffes, 6 antelope, 1 rhino, 12 hyenas, 7 hornbills and 4 ostriches (Table 2; Simons 2014: 39–40).

Animal	Initial Quantity	Surviving Amount
Elephant	32	11
Giraffe	8	5
Antelope	20	6
Buffalo	16	0
Rhinoceros	2	1
Hippopotamus	1	0
Hyena	12	12
Lion	4	0
Ostrich	4	0
Hornbill	12	7

Table 2: Lorenzo Cassanova's 1869 expedition for the Hagenbeck company from Egypt/Ethiopia to Hamburg.

Of the £19,140 value of Hagenbeck's cargo, the surviving animals were only worth £6,830 (Simons 2014: table 2.3).¹¹ If there was an expectation of losing up to two-thirds of a delivery in the nineteenth century, then it must have also been a reality for the Roman beast trade. Perhaps this is why records of only late arrivals and malnourishment are preserved in the ancient sources. Travel-related deaths of animals are not mentioned because they were simply the norm and were to be expected.

However, it must also be recognized that there are limitations to using the nineteenth century trade in exotic animals as a direct comparative case study. Most notable are the technological differences between the Roman period and the nineteenth century. The hunter companies of the 1800s had access to tools such as guns and steam engines to expedite the time spent transporting animals back to Europe and America. Yet, these technological advancements came at their own price. Exotic animals were valuable products and hunters were encouraged to bring animals back in the best condition, as seen in Hagenbeck's (1912: 6–7) descriptions of the early years of his father's exotic animal business.¹² Therefore, guns would have been used only as a final solution, favouring more traditional methods of capture. For example, in Hagenbeck's

(1912: 53–73) lengthy description of how African animals are captured, guns are only referenced when animals are being killed for food or game. Most of these capture techniques involved local populations and traditional methods of capturing animals, presumably as they caused as little visible harm to the animal as possible. This can also be seen in the number of local huntsmen who were hired by these companies to assist in the successful capture of wild animals. For instance, when describing Nubian hunters, Hagenbeck (1912: 48) notes that he ‘knows the favourite resorts of his quarry, and follows their trail with those remarkable powers of tracking’.¹³ Not only did local contributors bring valuable knowledge of the surroundings, but they would have also brought centuries of institutional knowledge in hunting and capturing these animals. This is reminiscent of the use of local huntsmen by the Romans in early accounts of capturing and displaying exotic animals.¹⁴ Further, while the use of trains would have expedited the transportation process, the journey by train would have caused significant stress on the captured wild animals and would have likely led to higher mortality rates than using slower non-motorized methods. Modern studies on the causes of stress in wild animals place significant emphasis on minimizing travel time and unexpected noises or movement, both of which would be unavoidable on steam-powered modes of transport (Waas et al. 1997; Wasser et al. 1997; Hayssen 1998; Dembiec et al. 2004; Montes et al. 2004; Teixeira et al. 2007; Santurtun and Phillips 2015).

Nineteenth century sources therefore provide the ancient historian with a detailed record of how external, colonizing populations hunted, captured and transported animals that were deemed exotic for the purposes of entertainment. While the strength of these sources is in their detail and the specificity of the number of animals captured, compared to how many made it to their final destination, their limitations must also be recognized. As seen with the records of Cassanova’s 1869 expedition above, the detailed records of wild animal transportation often discuss extraordinary occurrences. This was a disastrous expedition and is likely not representative of a regular expedition. With this in mind, the Cassanova expedition should be considered an example demonstrating how unsuccessful these attempts to bring exotic animals to Europe could be, rather than what was the norm. However, there are several benefits to looking at the nineteenth century sources. Josef Menges’ comparison of prices between those in Eastern Sudan and in Europe aligns with what is seen in the costs of arena animals during the Roman period and those found in regions where these animals originated, I discuss this further in the section below. As explained by Menges (1876: 232–233), this difference in price was primarily due to the difficulties related to capturing and transporting these beasts, a challenge which the Romans also likely encountered. Further, Coup’s (1901) recounting of Paul Tuhe’s experience as a beast master confirms that young animals were often caught as they were easier to train. The focus on younger

animals is confirmed in Roman sources as well, as seen in the Great Hunt scene at the Piazza Amerina (discussed below) where huntsmen mounted on horses are depicted specifically capturing tiger cubs and distracting the mother tigress with mirrors (Wilson 1983: 24). The emphasis on capturing young animals is also theorized by Bomgardner (2009: 168) as the only way that animals could be suitably trained for the arena. Just as Paul Tuhe stressed the ease of acclimatizing young animals in the nineteenth century (Coup 1901: 26), perhaps, during the Roman period, similar emphasis was placed on animals intended to be trained for the arena and used several times as indicated by the Magerius mosaic and the named leopards.

Reconstructions of Roman Beast Trade and Complications

Having established the particular problems encountered by beast traders during the Roman period and the nineteenth century, and subsequent solutions, it is possible to create theoretical models of these journeys. This section will project two possible routes to highlight the time taken to carry out these transactions. These routes are Ara Agrippinensium (modern Cologne) to Rome (**Figure 1**) and Carthage to Pompeii (**Figure 2**).

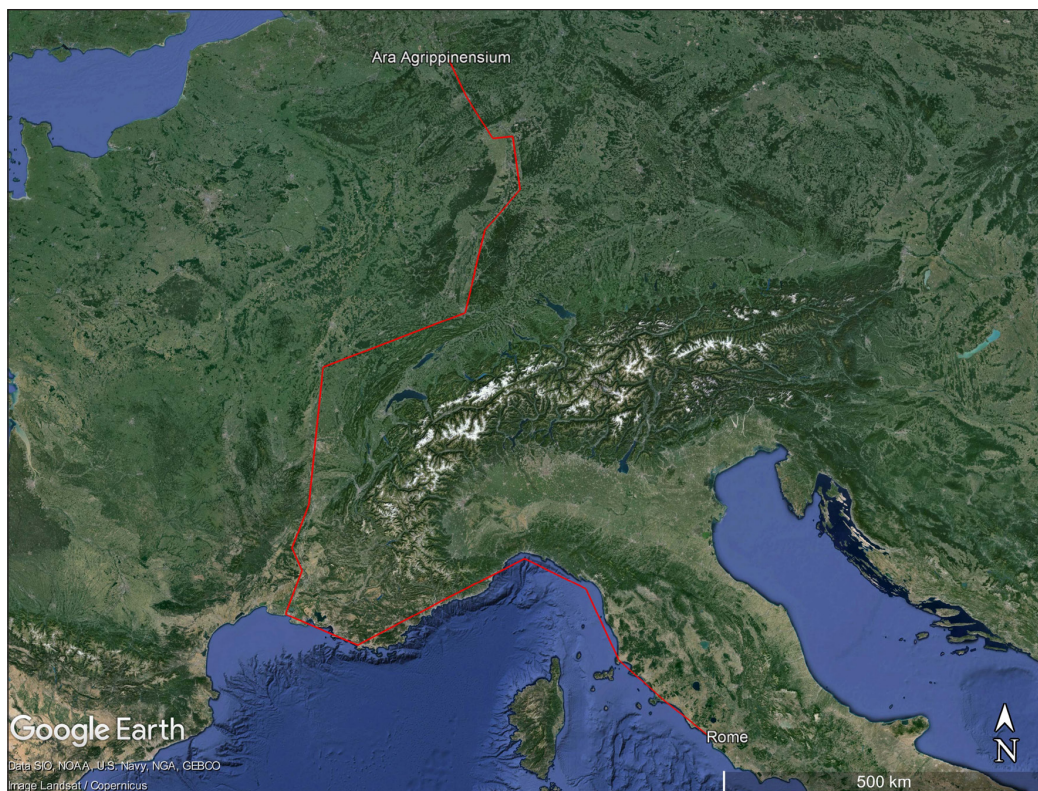


Figure 1: Map of a possible route between Ara Agrippinensium and Rome (Map produced using data derived from ORBIS: The Stanford Geospatial Network Model, <http://orbis.stanford.edu> and Map Data from Google, Data SIO, NOAA, U.S. Navy, NGA, GEBCO, Image Landsat / Copernicus, 2024).

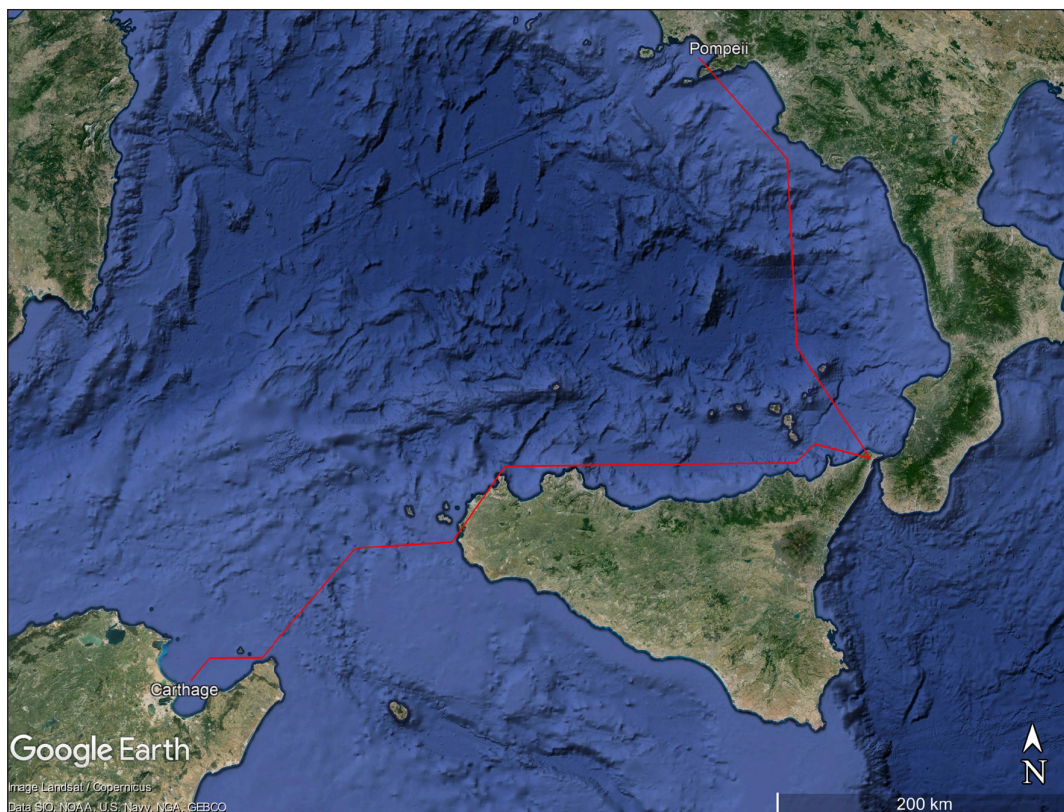


Figure 2: Map of a possible route between Carthage and Pompeii (Map produced using data derived from ORBIS: The Stanford Geospatial Network Model, <http://orbis.stanford.edu> and Map Data from Google Image Landsat / Copernicus Data SIO, NOAA, U.S. Navy, NGA, GEBCO, 2024).

The route to Rome has been included to illustrate a scenario in which it is securely attested that exotic beasts were brought into the city. Carthage was one of the largest metropolitan centres in not only Africa Proconsularis, but also in North Africa, making it a prime candidate as a centre for the movement of exotic beasts internationally. Africa Proconsularis is also the African province in which there was the highest density of amphitheatres on the continent. Further, the sheer popularity of *venationes* in the region meant that Carthage was likely the main location for major hunter troupes who provided and trained animals not only for international trade but also to perform locally. Carthage's location on the extreme northern coast of Africa and its proximity to Sicily provided an easy point from which ships could launch, while keeping to coastal routes to ensure regular stops to feed and care for their cargo. Ara Agrippinensium was the location where Tarquitiu Restutus Pisauru's bear hunt took place (*CIL* XIII, 8174). This location has been selected to give a northern scenario and as a comparison to the Carthaginian example. A northern European route also follows a path in which sea travel was minimized. River and cart travel would have given animals the least stressful journey possible to their final destination and a trip during which conditions could

be better controlled, which likely would have led to significantly lower death rates of animals in transit.

According to the ORBIS model, these journeys range in duration from seven days (Carthage to Pompeii) to 32 days (Cologne to Rome).¹⁵ The length of sea travel would have posed another problem for the Romans; reduced travel times were vital to the overall condition and survival of the merchandise (MacKinnon 2006: 148–149). Constant supervision would have been required for these animals to survive the trip. Travel fatigue, dehydration and malnourishment would have been a constant concern. Animals in poor condition are at a much higher risk of dying en route after succumbing to journey fatigue, deteriorating rapidly after three hours (MacKinnon 2006: 148–149). Travel could have been expedited through the use of rowers and oars.¹⁶ However, there were a variety of factors that could delay delivery, as seen in Pliny the Younger's (*Letters* 6.34) correspondence to Valerius Maximus lamenting the delay of the arrival of his panthers in Rome due to weather conditions. Claudian (*On Stilicho's Consulship* 3.354–355) further writes that the size of the animal was also a contributing factor towards journey duration, noting concern that the weight of elephants would slow down a ship significantly. To avoid such problems and minimize the mortality rate, several measures would have been put in place, further lengthening the journey. One particularly important precaution would have been the use of several stops along the way to allow the animals momentary reprieve from the stress of the sea voyage and to care for injured or ailing animals. This would have limited the use of open sea travel. While significantly faster, it would have made it extremely difficult for sailors to avoid the disastrous effects of the unpredictability of wild animals, especially the big felines that were so popular with audiences.

While a direct route would have significantly reduced transport time, it brought several other dangers with it. Firstly, goods were often pooled together and owned by several different merchants who each chartered space on the ship for their goods (Rathbone 2003; Leidwagner 2020: 12; Weaverdyck 2022: 665). This is possibly what can be seen with the presence of *Telegenii* stamps on olive oil amphorae in Ostia. Shipping exotic animals would not have been a year-round venture, so the *sodalités* would need to have interests in several different markets to finance their shipping operations in periods when there were no contracts for shipping animals to Europe. However, this was not likely the case for every voyage, and exotic animals could be transported on ships with crews unaccustomed to transporting such beasts across the Mediterranean, as described by Claudian (*On Stilicho's Consulship* 3.317–332) who mentions that even the sailors transporting animals for games feared their cargo. Transporting live cargo, such as wild animals, would have been significantly more difficult and would have required considerably more care than moving food goods.

This, along with the unpredictability of having wild animals onboard, would have led sailors to prefer calmer coastal routes and nighttime stops to ensure the safety of both their crew and cargo.

Similar considerations can be seen in other typically dangerous situations. For example, shipping according to the ancient sources is largely restricted to non-winter months with sailing only taking place during two to three months of the year (Hesiod, *Works and Days* 618–694; Vegetius, *Epitoma rei militaris* 4.39; Edict of Gratian, see Beresford 2013: 22–32; Suetonius, *Claudius* 19; Demosthenes, *Orationes* 35.10). However, scholarship suggests that this was not always the reality (Yardeni 1994; Peña 1998; Simonsen 2003: 267; Tammuz 2005; Marzano 2011; Leidwagner 2020: 63–65; Warnking 2022: 59–50). During this ‘off-season’ weather and winds were more unpredictable and sailors typically opted for more coastal routes where they could shelter in coastal geography and anchor in towns overnight to guarantee the safety of their cargo, ship and crew (Warnking 2022: 39–40, 43–44). A similar attitude is likely to have been applied to even more precious and unpredictable cargo, such as exotic animals. According to Symmachus (*Letters* 2.76.2, 5.56, 6.43, 7.121, 9.132, 9.142), animals appear to have been mostly shipped across the Mediterranean on a per-order basis, therefore, to maximize profits and reduce risk as much as possible such routes would have likely been stipulated by the merchants chartering ships to move their animals. These risks and the methods to avoid them would have been clearly stated in the shipping contracts, such considerations would have included, but not be limited to, dropping anchor at night, the presence of guards or specialists to supervise the cargo, and the following of coastal routes (Adams 2017: 203).

Modern veterinary manuals suggest that much of the stress related to journey fatigue, especially in wild herbivores, is the result of their proximity to human activity. High levels of stress in animals during the transportation process are known to lead to increased metabolic rates, hazardous behaviours, chances of injuries and susceptibility to diseases (CITES 2022: 3). This issue is also mentioned in the ancient texts. In addition to Symmachus’ (*Epistles* 2.76, 5.56, 6.43) lost bears, a majority of the 16 horses he sent to Rome either died during transportation or shortly after arrival. Symmachus (*Epistles* 6.43) also records the loss of 50 crocodiles because they would not eat. Similarly, Apuleius (*Metamorphoses* 4.13) writes that his fictional benefactor, Demochares, lost several animals due to heat, disease and prolonged containment.

A common solution to this problem is the Boma technique (**Figure 3**), which involves a period of containment (usually four to eight weeks) within an encampment to acclimatize animals to human activity and familiarize themselves with their immediate surroundings (Openshaw 1993: 195; Morkel and Kennedy-Benson 2007: 6; Zeiler and Meyer 2017).¹⁷ This transition period is not only connected to human activity, but it is

also the period in which animals are fed good quality feed and can be treated for any injuries that occurred as part of either their initial capture or their transportation to the campsite (Openshaw 1993: 195). This resting period means that animals are in the best possible condition before being moved to their final destination. Death of cargo en route to the destination must have been a common factor when moving these animals by cart and ship; this is precisely why most modern manuals stress the importance of moving wild animals tranquilized. This is emphasized not only to avoid the unpredictable nature of wild carnivores, but also to reduce stress as much as possible, giving the animal the best chance of survival.



Figure 3: Modern Example of a Boma Enclosure for Wildlife (Photo: Fossil Rim Wildlife Center. Reproduced with permission).

However, there is very little evidence for the existence of Boma-like structures in the archaeological record. This is likely due to their temporary nature. Bomas are typically set up close to the capture destination and designed to be temporary structures built from organic materials (e.g., thorn bush) where wild animals become acclimatized to their new environment (Raath 1993: 496). While it would be remiss to suggest that people capturing exotic beasts during the Roman period were consciously practicing such a technique without any direct contemporary references, it is possible that the same effect could have been achieved through unintentional methods. The often-remote location of capture for these animals would require a campsite to be established before final transportation to a more permanent holding or training facility. If temporary

holding sites were utilized by hunters in the field during this period, resources would have been limited. These structures were likely built like those in recent history, by making use of readily available resources, and would, therefore, have been broken down before moving onto the next destination, thus, making them nearly impossible to detect in the archaeological record. Additionally, the impromptu nature of these structures and the capture of animals in the wild means that they were not likely held within cities initially, and, therefore, it is unlikely that they were located at sites where archaeological excavations have taken place. While cages are known to have been used for predators, holding pens may have been preferred for herd animals such as gazelle, which were often acquired in larger numbers and would not have required such labour-intensive containment solutions. This preference can be seen in the containment solutions on the Le Kef mosaic and Great Hunt mosaic of the Piazza Amerina where both are displayed without individual containers (Figures 4 and 5). The Le Kef mosaic displays ostriches and deer being contained in pens and the Great Hunt mosaic shows ostriches being carried onto the ship by hand with very little containment. This would account for the lack of archaeological materials attesting to these structures. Besides, other than in situations where an animal died in transit or during containment due to capture-related injuries or illnesses, very little lasting material would be available to detect boma activity.¹⁸



Figure 4: The Le Kef Mosaic (Photo: www.romeartlover.it. Reproduced with permission).



Figure 5: The Piazza Amerina Great Hunt Mosaic (Photo: Damian Entwistle. CC-BY-NC 2.0).

Evidence for such containment sites can be found in areas where long-term containment would have taken place, such as in military contexts, as seen with the discovery of bones of bison and bears at the fortress of Montana in Moesia Inferior (Epplert 2001a: 213; Coleman 2006: 192; Lindberg 2019: 258–259). While this discovery reveals an admittedly unsuccessful attempt at keeping animals alive, the fortresses' location close to the Danube suggests that animals were contained here for some time before continuing their journey further downriver (Epplert 2001a: 213). Further, evidence of containing animals has been discovered at the military sites of Zugmantel (western Germany) and Dambach (north-eastern France) (Epplert 2001a: 217–219; 2016: 137). From an archaeological perspective, at least, it appears as if the Roman military made use of temporary containment facilities to hold animals until they were ready to continue the journey to their final destination. The relative scarcity of these structures in the archaeological record is not surprising. Even the famed *vivaria* (structures designed for holding animals long-term) of Rome attested in the ancient literature and epigraphic records are difficult to locate (Procopius, *The Gothic War* 1.22.10, 1.23.13–23, 5.32.10–11, 5.33.14–17; Juvenal, *Satires* 12.102–106; Aelian, *Characteristics of Animals* 2.11; *CIL* VI, 130; *ILS*, 1578). While the Imperial facility at Laurentum can be ascribed with certainty due to its repeated mention in epigraphic evidence the others have not yet been located (*CIL* VI, 8583; *AE* 1971, 68; possibly also *CIL* VI, 10208, 10209).

This does not explain why the ancient record has very little mention of animal mortality rates on these ships until Apuleius, and later Symmachus (*Letters* 2.76.2), who was outraged at the poor condition of his bears. Similar to gladiators, there may have been an expectation for continued returns from these animals. The Magerius mosaic and many other mosaics from North Africa attest to the popularity of trained animals for beast hunts; this is also found in the literary evidence recording the use of animals in Rome for entertainment. The assumption that animals destined for the arena would die there is largely based on the lavish late Republican games and Imperial games at Rome. These games were financed by the richest men in the Empire who could afford such an expenditure — especially during the Imperial period, when the emperor's games sourced animals from the multiple *vivaria* that bred and trained animals for this purpose. Is it possible then that many beast hunts with exotic animals outside of Rome did not end in the death of the animal? The naming of the leopards in the Magerius mosaic suggests that these animals would have been known to onlookers, as they appear similar to how named racehorses and charioteers are depicted in chariot mosaics. Just like gladiators, killing such expensive and trained animals may have come with an additional cost, which may explain why the inscription on the Magerius mosaic quotes 500 *denarii* for each leopard, but in fact, he paid them 1000 (AE 1967, 549 = AE 2000, 1597 = AE 2007, 1684).

Additionally, hunter troupes, such as the *Telegenii*, must have also had locations to both store and train their animals. It may be possible that smaller *vivaria*-like structures could be found around North Africa which housed animals and provided a training ground for both animals and hunters to rehearse before local performances. Is it possible that the training grounds for organizations like the *Telegenii* served as a holding location for animals that were being prepared to perform in arenas outside of Africa? This may account for the lack of complaints regarding the poor condition of arena animals upon arrival or even the death of several. Time in these training grounds would have essentially served as an unintentional Boma period, allowing for animals to heal, be fed and become accustomed to human activity before being shipped.

The Cost of the Exotic Beast Trade

Taking journey fatigue into consideration, the subsequent costs demonstrate that purchasing animals for the games was immensely expensive. For comparative results, this model will assume that a beast hunt will be held on a scale like what is inscribed on the Magerius Mosaic in the mid-third century AD, involving four leopards and hunters. The mosaic (AE 1967, 549 = AE 2000, 1597 = AE 2007, 1684) records that the costs for these leopards and their hunters totalled 4,000 *denarii*, 1,000 per leopard/hunter

combination. This model assumes that wild animals are being captured and transported on a ‘per order’ basis and so it is reasonable to assume that some animals would die along the way. To account for this loss, Cassanova’s expedition for the Hagenbeck company (Simons 2014: 39–40) will serve as a basis for average loss on a journey. The resulting average loss incurred during Cassanova’s expedition was 37.8%. To ensure that at least four leopards were able to be shown at these games, those responsible for the capture and transportation of the animals would require at least ~2.5 times the required animals, in this case, 10 leopards.

Assuming costs similar to what is shown on the Magerius Mosaic, it could be expected that these games would cost a total of 10,000 *denarii*. While this would have been a modest event in comparison to something like a gladiatorial showing in which 20–30 pairs were put on for 50,000 *sestertii* (12,500 *denarii*), it remains in the financial boundaries of the provincial elite. Magerius was hosting his shows in North Africa however, and as seen with the nineteenth century accounts, prices were significantly different locally to their European counterparts. Diocletian’s Price Edict of AD 301 illustrates this well, with leopards categorized into two classes: a first-class leopard was priced at 100,000 *denarii* and a second-class leopard was not much cheaper at 75,000 *denarii* (Crawford and Reynolds 1979). The Price Edict must have been more representative of the costs of these animals outside of North Africa. Applying these prices to this model results in a very different picture. If an organizer only wanted first-class leopards, the resulting cost for 10 leopards would be 1,000,000 *denarii*. For only second-class leopards, 750,000 *denarii*. Finally, for an even mixture of the two classes, 875,000 *denarii*. Note also that the Price Edict makes no mention of the inclusion of hunters, so it must be assumed that this price was only for the leopards.

Model	Price in <i>denarii</i>	Price in <i>sestertii</i>
Magerius (1,000 <i>denarii</i> per leopard/hunter)	10,000	40,000
Diocletian’s Price Edict (all 1 st class leopards: 100,000 <i>denarii</i> per leopard)	1,000,000	4,000,000
Diocletian’s Price Edict (all 2 nd class leopards: 75,000 <i>denarii</i> per leopard)	750,000	3,000,000
Diocletian’s Price Edict (mix of classes 50/50)	875,000	3,500,000

Table 3: Recreations of overall costs of animals as per the mortality rates of Cassanova’s expedition (average loss of 37.8%).

The difference in price between these projections based on the Magerius Mosaic and Diocletian’s Price Edict (**Table 3**) illustrates that there must have been a stark difference

between the beast hunts displayed in North Africa and the rest of the Roman Empire. This mirrors what is found in the nineteenth century accounts recording the significant 7,500% markup in price between buying animals locally and purchasing them overseas. Even a modest set of games with only four leopards appears to have been an impossible financial feat for most members of the provincial elite during the early fourth century AD. The lack of pre-third-century AD evidence for the costs of exotic animals for the arena only complicates this matter more. It is difficult to say if the exclusion of specific species is evidence for the exclusive use of animals that could be captured and bred locally, such as boars, bears and bulls for these games. Easily bred and herded exotic animals, such as ostriches (5,000 *denarii*), were within the financial realm of the local elite hosting games but do not appear in the inscriptions and mosaics of beast hunts outside of North Africa. This sits right between the two classes of boar (first class: 6,000 *denarii* and second class: 4,000 *denarii*) which could have been captured locally and, therefore, avoided the complications associated with capturing and transporting animals from Africa.

The sheer financial undertaking of purchasing exotic animals is highlighted by the contrast in price between African animals and other commodities outlined in Diocletian's Price Edict. As mentioned above, some animals that could be more easily herded and transported fetched lower prices: ostrich (5,000 *denarii*), wild boar (first class 6,000 *denarii*, second class: 4,000 *denarii*), stag (first class: 3,000 *denarii*, second class: 2,000 *denarii*), and onager (5,000 *denarii*). Predators fetched a much larger profit, e.g., lion (first class: 150,000 *denarii*, second class: 125,000 *denarii*), leopard (first class: 100,000 *denarii*, second class: 75,000 *denarii*), and bear (first class: 25,000 *denarii*, second class: 20,000 *denarii*). Comparing these prices with basic staples included on the Price Edict shows the significant disparity and makes it clear why such investments in presenting these beasts were prestigious in Antiquity. The price for grains demonstrates that a premium was applied to goods that were either processed (e.g., hulled millet: 100 *denarii* and unhulled millet: 50 *denarii*) or which had to be imported (e.g., hulled rice: 200 *denarii*). Wine and beer prices (per *sextarius*) illustrate similar trends, with prices for imported wines being higher overall (e.g., Picene wine: 30 *denarii*, Maeonian wine, boiled down one-third: 30 *denarii*, and Golden Attic wine: 24 *denarii*), whereas alcohol made with readily available ingredients were much more affordable ('ordinary' wine: 8 *denarii*, wheat beer: 4 *denarii*, barley beer: 2 *denarii*). Other imported food goods also highlight the expense associated with prestige goods, such as salt, where the price is set at 100 *denarii* per 1,000 *modii*.

Many of the commodities outlined in the Price Edict do not come close to matching the prices outlined for exotic arena animals. When they do, these are often prices for

extremely prestigious products and accessible only to a small percentage of the Roman Empire's populace (e.g., 1 lb unprocessed silk dyed purple: 150,000 *denarii*, refined or spun gold: 72,000 *denarii*, a racehorse: 100,000 *denarii*). Even the price of slaves does not compare to many of the more desirable animals, the most expensive of which is priced at 30,000 *denarii* (Salway 2010). To further demonstrate the exorbitant prices of these animals, soldiers were the best recorded wage earners under Diocletian and only earned 1,350 *denarii* per year (Alston 1994: 115). Even in the context of euergetism, the cost of exotic animals was significant. The *Lex Coloniae Genetivae* (71) of the first century BC states that aediles were expected to host a *munus* or *ludi scaenici* costing no less than 2,000 *sestertii* (500 *denarii*) with an allowance for a further 1,000 *sestertii* (250 *denarii*) from public funds. Furthermore, the *Aes Italicense* (29–30) of AD 177 states that games under 30,000 *sestertii* (7,500 *denarii*) were considered *munera assiforana* and did not qualify for the price restrictions put in place to make gladiatorial combats more affordable. The uppermost price bracket of the *Aes Italicense* is set at 150,000–200,000+ *sestertii* (37,500–50,000 *denarii*). According to Diocletian's Price Edict, even the cost of a single lion is two to three times more expensive than the standard prices for gladiators outlined during the joint reign of Marcus Aurelius and Commodus. Expanding this to other forms of euergetism only confirms the unaffordability of exotic animals. Duncan-Jones' (1982: 75) analysis of North African costs demonstrates that the cost of building projects fell into five categories, 50,000–150,000 *denarii*, 25,000–50,000 *denarii*, 12,500–20,000 *denarii*, 5,000–12,500 *denarii*, and 750–3,500 *denarii*, of which 32 buildings (48.5%) fall in the lower two categories. A similar trend can be found in the cost of statues in North Africa, with 59.1% being valued between 750 and 1,750 *denarii* (Duncan-Jones 1982: appendix 1.2). It is not surprising that exotic animals are recorded most commonly in Rome. The prohibitive cost of these animals was simply more than most provincial elite could afford. The only exception for this appears to have been for the North African elite who could pay for the services of the *sodalités* who hired out animals and hunters as needed, bypassing the need to purchase these animals individually. Animal prices could have also been affected by the methods by which they were transported to their final destination. A longer, but safer route, along the coast would naturally lead to greater costs at further destinations. By extending the travel time, merchants would be increasing the shipper's cost of feeding and paying their crew (Warnking 2022: 39–40). Additionally, the hazardous nature of the cargo may have warranted a higher price from the shipper.

This leads to the question of how representative sources such as the Magerius Mosaic and Diocletian's Price Edict were of actual prices for exotic animals in the wider Roman Empire. As mentioned above, the difference in the prices represented in the Magerius

Mosaic compared to other sources from Europe and Asia Minor (such as the Price Edict) suggests that North Africa enjoyed a comparatively affordable economic landscape for exotic animals. This is reinforced by the numerous artistic representations of premium arena animals, such as leopards and bears, along with the inclusion of such animals in the local epigraphic *corpus*.¹⁹ The Price Edicts illustrate that the maximum prices for these animals were significant, yet it is uncertain how common these prices were. It must be recognized that the Price Edict was created during a period of economic decline for the Roman Empire and cannot be representative of the price for these animals throughout the Roman period. What the Price Edict does illustrate is the prestige associated with specific arena animals, specifically predators. This is reinforced by the lack of representation of these animals in public spectacles outside of North Africa and Rome. This suggests one of two causes, either the price to display these animals was simply unobtainable for most, or the logistics of importing these animals into other parts of the Roman Empire outweighed the prestige associated with hosting spectacles featuring exotic animals. Likely, the actual reason for the lack of premium arena animals outside of North Africa and Rome is a combination of these two causes. The Price Edict demonstrates that arena animals, specifically predators, were priced much higher than livestock. The section related to animals (XXXII.1), which specifically excludes African animals, provides much more affordable prices (e.g., best Arabian camel, 12,000 *denarii* or best bull for breeding, 5,000+ *denarii*). Some animals in this section are significantly higher, such as a racehorse (100,000 *denarii*) or a ‘camel with two humps’ (60,000 *denarii*, this type is specifically differentiated from a Bactrian camel, 25,000 *denarii*). However, these are generally animals that hold significant prestige or potential financial return, like the racehorse, or they face the same importation process as African animals, such as the various species of camels. What differentiates the animals listed in this section (horse, mule, camel, donkey, oxen, bull, cow, ram, sheep and goat) from the African animal section is that they are, for the most part, animals that could be bred locally and did not require importation from elsewhere. The only exceptions to this in the African animal section are those which can be captured relatively easily (such as the ostrich) or species widely available in other parts of the Roman Empire (bear, boar or stag). Wild animals specific to North Africa would have been more difficult to source compared to more common livestock that could be bred and reared locally. This would have required hunters to capture these animals and then transport them to a holding site and feed them and, eventually, take them onto their final destination.

When comparing this to epigraphic evidence recording *venationes* in Europe there is very little specificity about what was presented (e.g., *AE* 1975, 256). Even when looking to the *edicta munerum* at Pompeii which served to advertise upcoming games, specific

animals are not mentioned, simply opting to refer to this part of the spectacle as a *venatio* (e.g., *CIL* IV, 3884 and *CIL* IV, 1179; for a full list of the *edicta munerum* of Pompeii see Sabbatini-Tumolesi 1980). Prior to advertising upcoming games organizers must have already purchased animals for display and would be aware of which species were planned. However, the only indication of which species were displayed comes from monuments erected following the games. The inclusion of terminology such as *bestiarum Africanarum* (*CIL* IX, 2350) indicates that the presentation of such animals was immensely prestigious, and it surely would be in the benefactor's interest to include in advertisements of their games. One possible explanation for the exclusion of specific species in the epigraphic corpora is that benefactors were unsure if certain species would arrive (Houston 2024: 87–88). This can be seen in a letter from Pliny the Younger reassuring Valerius Maximus that even though his panthers did not arrive in time for his spectacle, he still deserved credit for his investment and generosity:

‘I am sorry the African Panthers you had brought in such quantities did not turn up on the appointed day, but you deserve the credit although the weather prevented their arriving in time; it was not your fault that you could not show them’ (Pliny the Younger, *Letters* 6.34.3).

However, without additional accounts indicating attempts to import exotic animals for games that were not sponsored by the emperor, such as the accounts of Valerius Maximus or Symmachus (*Letters* 2.76.2), it is difficult to ascertain how common such spectacles would have been outside of Rome and North Africa. It is perhaps more likely that local benefactors opted for local fauna simply due to the reduced risks and costs associated with the importation of exotic animals. However, the more ambitious and wealthier elite may have considered the risks of purchasing these animals worth it, considering the potential for significant public reception and commemoration associated with such a spectacle.

Conclusion

The knowledge provided by both nineteenth century and modern veterinary sources, along with what we know of the difficulty of capturing, training and transporting exotic animals in the ancient world, indicates that such importation of animals around the Roman Empire was likely limited. While this article is not trying to suggest that animal traders consciously held animals for a purpose such as the boma technique, if, however, animals were held in a central port hub such as Carthage for the treatment of capture-related injuries and training, this would have acted as an unintentional boma period, thus significantly improving an animal's chance of survival. Carthage would have been

a good candidate for a central hub, as it allowed for short trips along coastal routes in case there were any complications during the journey.

However, these potential complications led to a significant disparity between the costs for animal games locally and in Europe. Even in cases where benefactors could afford to purchase such animals, the risks associated with transporting them around the Empire meant that there was no guarantee that these animals would arrive on time or at all. The only way to guarantee that such animals would arrive in the numbers necessary to meet any promises made prior to the games would have been to overorder. However, as seen above, this would have come at a significant additional cost that would have been unobtainable for most local elite around the Empire. Therefore, while it was certainly possible for benefactors to obtain exotic animals for their games, a combination of the cost, risk, and overall public reception would have caused many benefactors to hesitate. This is likely why the number of gladiators was often promoted more than the animals included in these spectacles. Not only were gladiators cheaper to purchase, they were also trained and kept locally, meaning that the benefactor could see what he was purchasing beforehand, and a *lanista* could guarantee numbers long before the games took place.²⁰ This was not the case with exotic animals. They were costly and, even if they did arrive on time, the condition of the beasts would have been a mystery, potentially leading to disappointment on the day, both on behalf of the benefactor and the audience. This perhaps suggests that most provincial benefactors had to balance risk, cost, and the fact that they would have to finance more games in the future (if they intended to have a successful political career). Most would not have had the security of a *vivarium*, such as those in Rome, where animals could be stored before the games and nursed back to health if necessary. However, a *venatio* (beast-hunt) would have been an expected component of any *munus* (games). Perhaps this is why we do not hear about the specific animals being presented at beast hunts, as they were usually animals that could be captured locally and more affordably: boars, bears and deer, etc. In North Africa, however, prices remained low, and resulted in a higher frequency of recorded exotic beast hunt spectacles in the region.

This paper also shows that capturing and transporting these animals on a per-order basis was a wasteful process and would not have been a viable business model, a process also resulting in skyrocketing prices for these games. These costs would explain why inscriptions recording beast hunts outside of Africa and Rome rarely document which animals were presented. If benefactors could only afford locally captured animals, then perhaps they were not considered exceptional enough to have been included in the record of an event, outside of merely documenting that a beast hunt had occurred as part of the games.

One of the primary limitations of the research on the exotic beast trade is the lack of evidence concerning the organization of these games from a logistical perspective. Much of the evidence that is currently known comes from the benefactor's perspective, which is useful in informing academic discourse on the popularity of certain event types or the presence of beast hunts throughout the Roman Empire. However, this evidence is also weighted by the benefactor's perspective, including only what benefactors considered to be desirable elements of the games to preserve, which often did not include the species of animals presented for public spectacle. While some evidence, like archaeozoological remains and artistic artefacts, can allude to the presence of certain animals, they often come with very little context as to how those animals ended up there. This article serves as an attempt to present a potential reconstruction of the exotic beast trade combining what is known from the limited archaeological and literary evidence with how those in the nineteenth century dealt with the challenges of capturing, transporting, and taming wild animals. Further research remains to be done on this topic. For example, the connection between the North African *sodalités* and maritime trade presents an opportunity to better define how exotic animals would have been brought to other parts of the Roman Empire. As illustrated by the presence of *Telegenii* emblems on amphorae at Ostia and the potential connection between Sorothus's involvement with the *Tauriscii*, it is possible that these hunter troupes were much more than local providers of animals and hunters for the games. Additionally, there is much to be gained from a comparative cross-cultural and cross-chronological historical methodology, specifically the presence of a more complete primary record. Using nineteenth century sources to fill the gaps found in the historical record of the Roman Empire is only one potential example of applying this methodology; this is by no means the only period relevant for such a comparative methodology. Animals have often been used for entertainment throughout history and each period presents another opportunity to learn how spectacles were organized and how that knowledge could be applied to a Roman setting.

Notes

- ¹ Such as the discovery of the jawbone of a lion during the excavation of a boat in Pisa, see Sorrentino 2000 for details.
- ² Based on *AE* 1934, 146 (second century AD), Meiggs 1960: 287 suggests the purpose of trade was purely for ivory, suggesting an association between Sabratha and the ivory trade. However, Scullard 1974: 253 widens this theory, claiming that it is entirely possible that this is an office for elephant trade in general.
- ³ This evidence is somewhat speculative and is suggested in Epplert 2014: 512. Epplert 2016: 133–134 notes that perhaps an inscription to the *Albii* family's health set up by the local governor was in response to supplying animals for one of his spectacles. Epplert 2001b discusses this in depth as well. See also Egger 1966 and 1967 for general discussions of the epigraphic evidence that led to this theory.
- ⁴ For an image of this mosaic see Bartoli and Bellori 1791: 55, plate 15, figure 1.
- ⁵ Dunbabin 2016: 203 states that these comments by the spectators fit the theme of a drinking party: ('We shall strip off', 'We have come to drink', 'You are talking too much', 'Let us enjoy ourselves'. She does note that the final exclamation, 'We hold thee', is more obscure, but does not provide more comment.
- ⁶ An excellent example of this type of North African red slipware can be found in Herrmann and Hoek 2013: 494, plate 8c.
- ⁷ For reference inscriptions for the emblems and ciphers see: *CIL* VIII, 12421 (*Mensaurii*) and 11237 (*Caprasii*).
- ⁸ See also Pliny the Elder, *Natural History* 5.1.11 and MacKinnon 2006: 144.
- ⁹ For a detailed discussion into the lack of species specification see Houston 2024.
- ¹⁰ See also Rothfels 2002: 55–57 for more discussion on Josef Menges' figures.
- ¹¹ This price is based on a breakdown of costs for exotic animals in 1879 as advertised by Charles Jamrach in London.
- ¹² See also Hagenbeck 1912: 46 and 57 for further emphasis on the importance of keeping animals healthy to maximize profits.
- ¹³ See also Coup 1901: 27 for the involvement of indigenous hunters in Paul Tuhe's expeditions, and Tait 2016: 180 on the use of indigenous hunters as part of an animal displays 'atmosphere'.
- ¹⁴ King Bocchus of Mauretania gifted native spearmen for Sulla's games in 93 BC: Seneca, *De Brevitate Vitae* 13.6 and Pliny the Elder, *Natural History* 8.20. Reference to a hunter troupe known as the Shikarees hired to capture felines in Laodicea: Cicero, *Letters to Friends* 2.11.2. Juba used local hunters to dig pits to capture elephants: Plutarch, *Moralia* 972b and Pliny, *Natural History* 5.1.11. Numidian bears paired against Ethiopian hunters in 61 BC: Pliny the Elder, *Natural History* 8.54.131.
- ¹⁵ Total length for these journeys as per ORBIS (orbis.stanford.edu) [last accessed 25 October 2023].
- ¹⁶ Claudian, *On Stilicho's Consulship* 3.325–327, 365 notes that boats carrying animals were equipped with rowers.
- ¹⁷ Openshaw 1993: 195 refers specifically to the use of the Boma technique in relation to herbivores. For modern techniques on how African carnivores are transported, see Epsie 1993.
- ¹⁸ Similar preservation issues persist for tracing other entertainment-related phenomena that we have visual or textual evidence for, but due to the organic and temporary structures involved, they are nearly impossible to detect in an archaeological context. These include holding pens for what must have been *venationes*, as seen in Le Kef mosaic illustrating the containment of ostriches and deer with netting Dunbabin 1978: 69, plate 54. Similarly, there are numerous temporary amphitheatres and circuses in Rome and throughout the Empire attested in literary or epigraphic evidence but not archaeologically (see e.g., Cassius Dio, *Roman History* 43.22.2–3 and Humphrey 1986: 329–330 for the chariot activity at Auzia without a precise circus location).
- ¹⁹ For leopards and bears, see the 'Mel Quaestura' mosaic from Carthage (Dunbabin 1978: 71, 250) or the *venatio* mosaic from Maxula (Dunbabin 1978: 72–73). For the inclusion of animals in the local epigraphic *corpus* see the inscription recording four days of gladiatorial games and panthers at Carthage, *ILAf* 390.
- ²⁰ For more on purchasing gladiators, specifically in relation to the *Aes Italicense*, see Oliver and Palmer 1955.

Abbreviations

- CIL* *Corpus inscriptionum latinarum* – Königlich Preussische Akademie der Wissenschaften zu Berlin. 1893 *Corpus Inscriptionum Latinarum*. Berlin. Volumes 3, 6, 9, 13.
- AE* *Année Épigraphique* – Presses Universitaires de France. Paris. Volumes 1961, 1967, 1971, 1975, 1998, 2000, 2007.

ILAf *Inscriptions latines d'Afrique* – Cagnat, René, Alfred Merlin, and Louise Chatelain. 1923. E. Leroux. Paris.

ILS *Inscriptiones Latinae Selectae* – Dessau, Hermann. 1892–1916. Weidmannos. Berlin.

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