

Extraction and Captive Management of Wild Animals, 18th Century to Present Day

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1.1. Preamble: ancient practices

The keeping of wild animals in captivity dates back to ancient times and has been practiced in many parts of the world. It played not only a food role, with game parks, but also an ornamental and ostentatious role. Animals exhibited during the Roman games bore witness to the splendor of the organizers, to their supremacy over the wild world and to imperial expansion. In the Middle Ages, many aristocrats and ruling elites in Central Europe, the Byzantine Empire or the Umayyad Caliphate in Cordoba maintained ostentatious menageries in addition to game parks. The aristocratic and princely menageries of the modern era showed, in turn, the political power, pomp and culture of their owners, as well as the support given to learned enterprises. Ottoman sultans kept felines, elephants and many other animals in their menageries, and the one belonging to Suleiman the Magnificent in Constantinople included a lion house and a menagerie of pachyderms (Faroghi 2008; Trinquier 2011; Beck and Guizard 2012; Lesage 2019). In France, the menagerie at Versailles, built by order of Louis XIV in 1664, was the heart of a vast anatomical dissection enterprise that relied on the cadavers of its captive animals (Guerrini 2015). The institution also embodied a shift in sensibilities regarding captivity, which is why animals were mostly kept in outdoor yards. However, this presentation was

Animal Suffering,

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primarily for scenographic purposes, as the wings of the flying birds were mutilated in order to keep them on the ground in the yards and to give visitors the illusion of greater freedom. Moreover, animal fights were still in vogue and were featured in a seraglio built at Vincennes on the orders of Louis XIV, completed three years before the menagerie (Sahlins 2017). A democratization of access to wild animals began to take shape in the 18th century, with the princely menageries becoming more open to the public, and also with the development of commercial and fairground menageries, which was made possible by the intensification of animal extraction and circulation (see section 1.3).

1.2. Birth of the modern zoo: new forms of animal captivity

The menagerie at Versailles, whose sumptuous management crystallized criticism, was abolished during the revolutionary period. However, in 1792, Jacques-Henri Bernardin de Saint-Pierre, intendant of Paris' Jardin des Plantes, an institution founded in 1626 as a royal medicinal garden and which had become a center of French natural history, developed the project of establishing a national menagerie that would serve the work of natural history and public instruction (Laissus 1993, pp. 76–82; Spary 2005). The project, established within a turbulent political context, did not materialize immediately, but the Jardin des Plantes menagerie was formed in 1793 by the arrival of show animals seized from the public highway for security reasons and deposited in the Muséum National d'Histoire Naturelle, the former and now nationalized Jardin des Plantes. Seized animals from the stripped princely menageries were added to it, soon followed by acquisitions. The Jardin des Plantes menagerie, often considered by historians as the first zoological garden, quickly became a model, inspiring the creation of the London Zoological Gardens in 1828, which in turn guided the foundation of many other “zoos” (an abbreviation coined at the beginning of the 19th century), in a context of emulation between urban centers and between nations (Laissus 1993; Baratay and Hardouin-Fugier 1998; Mehos 2006).

The first theoreticians of the Jardin des Plantes menagerie insisted on offering the animals a freer captivity, in particular by placing them in parks (e.g. Lacépède 1804, pp. 17–22). However, reconciling captivity with freedom for the animals proved to be a difficult enterprise. The menagerie was part of the Muséum National d'Histoire Naturelle, a public institution whose vocation was, among other things, to mobilize natural history for the utilitarian purposes of agricultural and commercial development. This aim, which was in line with the agricultural programs of the early modern era, was strengthened by the republican project of improving the resources of the nation, within a context marked by food crises. The menagerie was, in particular, called upon to participate in the work of acclimatizing animals from other

lands to the local climate and conditions, in order to improve domestic livestock through crossbreeding and by adding new species (Lacépède 1795; Osborne 1994; Spary 2005). This mission reinforced the understanding of animals as resources whose productivity needed to be improved. While the French Revolution was the catalyst for projects to improve the lot of animals, as part of a broader societal renovation which included the abolition of human slavery, animals were not envisaged in any other way than in the service of humans (Spary 2005; Serna 2017). The acclimatization mission became important in Europe, and by extension in the colonial territories, in the 19th century, but it struggled to establish itself over the long term. It was marginalized from the end of the century, in particular due to the difficulties in acclimatizing animals and finding useful functions for the species being acclimatized, especially at a time of developing mechanization and competition from products from the continents of origin, such as ostrich feathers, in a context of imperial expansion (Osborne 1994; Baratay and Hardouin-Fugier 1998, pp. 177–179).

Another function initially envisaged for the menagerie, the study of the behavior of living animals, in the tradition of Buffon, remained subsidiary. It was first carried out with some success by Frédéric Cuvier, head keeper of the menagerie (1803–1838) and brother of the anatomist Georges Cuvier. However, Cuvier did not succeed in giving this function a solid institutional base. After his death, it was marginalized at the menagerie, as well as other European zoos, the difficulties in studying animals with a strongly constrained existence, and surrounded by increasingly large crowds, appearing to be the determining factor. Despite some exceptions, study programs of captive behaviors were preferentially conducted in laboratories from the 20th century, which saw the rise of scientific ethology. In zoos, the studies of behavior remained largely confined to occasional observations, and the empirical knowledge of keepers and employees in charge of the animals, which was often fine and detailed, was rarely called upon beyond the purposes of daily management (Burkhardt 1997, 2010; Baratay and Hardouin-Fugier 1998, p. 162; Hochadel 2005, 2011).

The scientific function of zoological gardens, often asserted from the beginning, was, in the 19th century, much more in line with the naturalist culture of inventory and classification of the world, which had been developing since the work of Linnaeus, and which was invigorated by imperial expansion. This approach encouraged the collection of large numbers of animals belonging to a wide variety of species. Once dead, many captive animals were mobilized for research in taxonomy (classification), comparative anatomy (analysis of the internal structures of animals) and morphology (study of the interactions between animal structures and their functions), the latter disciplines also serving the order of living things. Dead

animals and animal parts joined the display cases and drawers of natural history museums, regularly associated with zoos, many of which were created by zoological societies that also had libraries and exhibition spaces. Above all, the display of a wide variety of animals was encouraged by the educational mission of zoos, as well as by their recreational purpose, which required that spectacular animals (such as lions, bears, elephants, giraffes and monkeys) be displayed to crowds. The care taken to attract visitors was particularly strong in the numerically dominant private institutions, whose existence depended on revenues from paid admissions (Baratay and Hardouin-Fugier 1998; Åkerberg 2001; Mehos 2006).

The triple function of zoos – scientific, educational and recreational – rapidly transformed them into living museums or animated encyclopedias. For example, the aim of the managers of London Zoo in the mid-19th century was to “present as many types of [animal] forms as possible, with the view of illustrating the generic variations of the Animal Kingdom”. In 1864, they boasted that they had “by far the largest and most complete series of living animals in Europe”. By the end of the century, the number of mammals, birds and reptiles alone that could be seen during a visit reached nearly 3,000 animals¹. This encyclopedic paradigm required wide-ranging animal circulations in order to populate the cages, especially since the number of zoos multiplied throughout the century. The only Western European zoos founded in the 19th century still in operation in 1912, that is, those which escaped the multiple bankruptcies and closures, included, in addition to the Jardin des Plantes menagerie: London (1828), Dublin (1830), Bristol (1835), Manchester (1836), Amsterdam (1838), Antwerp (1843), Berlin (1844), Marseille (1855), Lyon (1857), Rotterdam (1857), Frankfurt (1858), Copenhagen (1859), Paris (the Jardin d’Acclimatation, 1860), Cologne (1860), Dresden (1861), Hamburg (1863), The Hague (1863), Hanover (1864), Karlsruhe (1864), Breslau (1865), Mulhouse (1868), Düsseldorf (1874), Basel (1874), Münster (1875), Posen (1875), Leipzig (1876), Elberfeld (1879), Lisbon (1883), Stockholm (1891), Barcelona (1892) and Königsberg (1896) (Loisel 1912, pp. 432–434). In 1900, there were 32 zoos in the United States, where the first zoological garden was opened in Philadelphia in 1859 (Kisling 1996).

While some zoo animals were born in captivity, either within the zoos themselves or elsewhere, for example, in the menageries of English aristocrats invested in breeding, who then proceeded to transfer animals (Ritvo 1987, p. 239), most were captured in their natural habitat, all the more so as the great diversity of animals and the presence of crowds constrained captive breeding.

1. *Report of the Council of the Zoological Society of London 1855*, p. 13, 1864, p. 18 (citations).

1.3. The rise of the animal trade

In addition to the many animals taken across Europe, the import of captive animals into Europe increased significantly in the early modern era as a consequence of developments in navigation, colonial expansion and scientific exploration. While, in the 16th century, imported animals were mainly ostentatious products that supplied the princely menageries, a dramatic increase in flows occurred in the 18th century, marked by a development of interest in natural history, embodied and encouraged by the popularity of Buffon's *Natural History* and the development of the Linnaean classification. The increased commodification of animals was linked to the development of commercial routes, including those of the slave and colonial trades. The trade in live animals involved thousands of individual, mainly small-sized animals every year (such as passerines, parrots and monkeys), imported from Africa, the Americas, India, Australasia or the Pacific Islands. On board ship, animals kept the sailors and travelers company and then, at the ports of arrival, they served as pets, ostentatious gifts, merchandise to be exchanged for money or as specimens that fed the taste for natural history. The commodification of animals was marked by a democratization similar to that which characterized the economy of other imperial products. Access to animals such as African and South American parrots, once reserved for the powerful, was extended to artisans in large urban centers. The pet culture developed, and, with it, fashion, such as canaries, taken from the Canary Islands since the 15th century and popular for their song, now partially reproduced in captivity, and cardinals, imported from the Americas and prized for their scarlet plumage, particularly after the end of the American Revolution in 1782. While only a fraction of animals arrived alive at their destination, their corpses, dissected, naturalized or petrified in alcohol, supplied the growing number of natural history collections (Hamy 1903; Robbins 2002, pp. 9–36; Baldin 2014).

In the 19th century, wild animals and the products extracted from them became mass consumption items, integrated into the first globalization of goods. Their acquisition achieved democratization as a result of a cluster of factors, including: the extension of the European sphere of influence; the extension of the colonial grip; improvements in means of transportation, including rail and steamboat, and communication technologies, such as the telegraph, which allowed for better coordination of supply and demand; the development of trading companies and international trade and the development of sophisticated hunting weapons (Rothfels 2002; Coote et al. 2017). In Europe and the United States, the demand for dead and live animals reached unprecedented levels with the advent of leisure culture and the development of mass entertainment institutions such as menageries, zoological gardens, circuses, natural history museums, which multiplied and opened to the

public, private museums and collections, and international and colonial exhibitions (Brandon-Jones 1997; Nance 2013; Coote et al. 2017).

This exposure of wild animals to crowds in turn reinforced the popular culture of appropriation and domestication of the wild. The possession of pets developed strongly in the 19th century, accompanying the bourgeois withdrawal into private space. New fashions emerged, such as that of aquariums from the middle of the century (Lorenzi 2009; Baldin 2014). The period from 1780 to 1950, that of the “civilization of beasts”, marked the peak of the domestic and tame animal presence in Europe, both in rural and urban spaces (Baratay 2008).

The associated thirst for appropriation was fueled by the development and professionalization of trade networks. Stores of naturalized specimens proliferated, supplying museums and private collections (Coote et al. 2017, p. 326). Traders in large live animals operated out of English and German ports (London, Liverpool, Bristol, Hamburg) (Flint 1996; Hanson 2002, pp. 71–84; Rothfels 2002, pp. 45–59). Among them, Carl Hagenbeck, based in Hamburg, developed a merchant empire made up of sprawling networks of collectors, mainly in Africa and Asia. In March 1910 alone, his collectors sent him 20 lions, two cheetahs, six hyenas, 300 monkeys, four rhinoceroses, an elephant, a giraffe, a buffalo, 12 antelopes, 17 Grevy’s zebras, warthogs, four dromedaries, eight horses, 40 ostriches, as well as many “small animals” from Africa, and tigers, leopards, several hundred monkeys, six elephants, antelopes and eight zebu from India (Loisel 1912, p. 327). Hagenbeck opened a Tierpark in 1874, then a zoo in Stellingen, in the suburbs of Hamburg, in 1907. These zoos served as animal storage facilities, training centers, and places for exhibiting animals, and also humans. Thus, in his Tierpark, Hagenbeck exhibited, among others, a family of Sami with reindeer, Sudanese people with horses and camels, “eskimos” with sled dogs, Sri Lankans with elephants, as well as Cameroonians, after the conquest in 1886. He thus contributed to popularizing the exhibition of exoticized humans², which is age old, but which became commonplace in zoos and colonial exhibitions from the end of the 19th century, to manifest the claims of conquest, “civilization” and domestication of the world extended to humans, themselves thus rejected to the outer limits of humanity with the racist support of physical anthropology (Bancel et al. 2002; Ames 2008; Blanchard et al. 2011; Bruce 2017, pp. 57–96, pp. 137–144).

Several other private zoological gardens invested in commercial policies to increase their financial incomes. This was the case with the Jardin d’Acclimatation

2. “Exoticism” refers to a form of cultural apprehension and appropriation, largely modeled on imperial geography, that related to distant, strange and fascinating otherness, which one enjoys appropriating, staging and domesticating (Staszak 2008).

in the Bois de Boulogne (1860), where Hagenbeck also presented human exhibits, and the Antwerp Zoological Garden (1843), both of which played an important role in the commodification of animals. According to an account from 1906, at the Antwerp Zoo, “[in] August of each year, for example, the aviaries and reserve stores often contain 50,000 to 60,000 small exotic passerines that are then purchased by dealers and hobbyists” (Loisel 1912, pp. 290–291). World War I brought a halt to the international animal trade and was a near-fatal shock to the Hagenbeck empire (Ames 2008, pp. 223–224). However, zoos, other animal-based industries and developing animal experimentation quickly spurred the resumption of trade. In 1927, the British animal dealer Chapman employed about 20 collectors, 14 of whom were based on the African continent, three in Asia, and others in Oceania and South America³. The appropriation of animals did not rely solely on the professionals of their trade.

1.4. A collective appropriation of wildlife

Political and economic elites in Africa and Asia regularly resorted to capturing wild animals for ostentatious or diplomatic purposes, by using them as gifts or medium of exchange. The practice was reinvigorated by the asymmetric negotiations accompanying European colonial expansion (Bodson 1998; Ringmar 2006; Buquet 2012; Simons 2019). In India, many rulers and notables owned rich menageries, a tradition that partly survived the British occupation. These collections were notably supplied by the port of Calcutta, an important center for animal trade (Brandon-Jones 1997). The injection of a growing number of animals into globalizing transfer networks was thus the result of a complex intertwining of local and global dynamics, political negotiations and colonial servitudes.

The taste for the company of wild animals and for private menageries and natural history collections encouraged an appropriation of animals that was often directly operated by amateurs. Amateur collecting developed considerably in colonial lands, where hunting seemed inseparable from conquest: supported by technological aids, in particular increasingly sophisticated firearms, it participated in the violent mastery of territories, with the big game hunter being “the archetype of imperial man” (MacKenzie 1997; Arzel 2014; Gissibl 2016, pp. 73–79 (citation p. 74), 88–89). Many military personnel, “explorers”, missionaries, colonial administrators and settlers owned naturalistic collections and small menageries out of a hunting and naturalist infatuation, to stave off boredom, to interact with local residents and to maintain ties with the metropolis, where specimens were often brought back or

3. “A world-wide industry,” *Chapman’s Monthly Notes*, 16, April–May 1927, pp. 1–2; also “Now is the time,” *Chapman’s Monthly Notes*, 18, October 1927, p. 3.

shipped. Collections offered “an illusion of cognitive control” over the colonial experience and environments, while the scholarly veneer conferred on these endeavors served to justify colonial conquest and control (Breckenridge 1989, pp. 209–211 (citation); Bonneuil 1999, pp. 161–165; Arzel 2018, pp. 200–206).

In the colonized territories, captures, operated by a multitude of actors, became a collective appropriation. In addition to their official activities, some settlers engaged in hunting and capture themselves, often in a subsidiary capacity. However, the collections of dead and live animals were mostly supplied by collecting, bartering and buying from rural populations possessing the ethological and technological knowledge necessary for the capture of these resources. Similarly, Western collectors and hunters sent by museums, zoos and traders bought or bartered from rural populations much more than they hunted themselves. Their work consisted mainly of inciting the surrounding populations to engage in mass collection, and then in selecting the captures and grouping those chosen into compounds before shipping them out together. This collective appropriation of animals, with marked environmental effects, whose flows were partially absorbed and redirected by animal traders, reached an unprecedented dimension from the interwar period, a time of territorial apogee that was accompanied by a growth in the European presence in the colonies. Colonial authorities supervised and encouraged appropriation. They regularly took charge of it themselves when it came to the animals most protected by colonial law, which did not so much protect the animals as the new colonial uses that were made of them. Among these, exhibitions in the cages and showcases of the zoos and museums of Western cities occupied pride of place, since they playfully demonstrated to crowds the extent of the conquest, mastery and domestication of the territories, underpinned by an increasingly well-oiled machine (Pouillard 2019).

The claims of efficient colonial management could not, however, hide the deadly economy on which exports were based. On the one hand, many of the young captured were by-products of hunting, recovered near to slaughtered animals. On the other hand, the specific quest for young animals, which were easier to handle and more amenable to human control, set in motion an enterprise of deliberate destruction of adults, especially mammals. For example, the official killings of Eastern gorillas carried out by the Belgian colonial authorities in 1948–1949 in Eastern Congo, by an official Capture Group led by a hunting officer who relied on local labor, resulted in the slaughter of a minimum of 21–28 gorillas for the capture of 12 young gorillas (Pouillard 2015).

The animals that survived the capture operations experienced a period of waiting in captivity compounds and places of deposit and transit, where a new wave of

mortality would mow down the individuals most weakened by the social and environmental changes imposed by their extraction. The distances to the ports of departure were sometimes considerable and the means of transport in the 19th century were crude, with the construction of railroads developing gradually in the second half of the century. Carl Hagenbeck, referring to the transportation of animals captured in the Egyptian Sudan by his suppliers to the Red Sea ports, noted that “in spite of the care given to them, many [...] succumb on the way” (Hagenbeck 1951 [1908], p. 153). The animals then underwent a sea voyage from Asia or Africa to European ports, which, at the beginning of the 19th century, took several months. Mostly they were taken on board ships chartered for purposes other than animal trade, and thus followed the sometimes extended routes of scientific missions, human migration and trade, including the routes of the slave trade until its effective abolition in the second half of the century (Robbins 2002, pp. 12–17, pp. 27–29, p. 32). While advances in navigation, particularly the development of steam-powered ocean-going vessels, gradually reduced crossing times, these remained difficult times for the animals. According to the testimony of animal trader Josef Menges (1876), who worked for Hagenbeck, losses during transportation regularly reached one-third and sometimes up to two-thirds of the captured animals (Rothfels 2002:57). In 1870, the director of the Jardin d’Acclimatation, Albert Geoffroy Saint-Hilaire, wrote:

When one has, as we have, the opportunity to frequently see newly landed animals and the cages in which they have undergone a journey sometimes several months long, one can understand the incredible levels of mortality that often occur during transportation, despite the most assiduous care (Geoffroy 1870, pp. 1–18).

The figures for animals arriving alive at Western urban zoos in the 19th century and during the first half of the 20th century, of the order of several hundred to thousands of individuals per year, for each institution (Pouillard 2019, pp. 236–238), therefore only tell a minor part of the appropriation orchestrated by the zoos, largely based on a colonial extraction with elusive networks, in terms of their extent and ramifications. The dead collections of museums were likewise based on wide ranging extractive processes: the zoological collections of the Paris Muséum National d’Histoire Naturelle alone included, all origins combined, 650,000 specimens in 1858 and 8.5 million in 1921 (Bonneuil 1999, pp. 151–152).

1.5. The confinement of wild animals

In the 19th century and during the first half of the 20th century, zoological gardens housed livestock that varied constantly according to the arrivals in two types

of installations. Parks, already present in many previous aristocratic menageries, were designed to allow the animals to move more freely and to allow visitors to better observe their movements, but the device caused mutilations to the flying birds. However, several renowned zoos developed large aviaries from the end of the 19th century, such as the one in the Jardin des Plantes menagerie (1888): 12 meters high, 37 meters long, 25 meters wide, dimensions considered “colossal” at the time, exceeding “all those that exist”, and allowing trees to be included⁴. In contrast, so-called “ferocious” animals, and those that could not withstand the temperate climate, in other words, the majority of the livestock, were kept in cages in buildings often equipped with heating systems. These buildings were expensive, therefore rarely replaced, and not very adaptable to accommodate a large, diversified and highly variable herd.

This situation created conditions of close proximity of the animals to each other and to the public. The resulting contagious transmissions, aggressions between animals, visitor violence towards animals and the inefficiency and technical failures of the heating systems, as well as various sanitary problems, led to significant mortality. A statistical study shows that the average longevity in captivity of primates that entered and died at London Zoo from 1865, the date of the opening of a new dedicated building, to 1926, the year of the destruction of the building, that is, 6,043 individuals, was 433 days, or around one year and two months⁵, whereas the age of entry of these animals was usually low, since they were generally imported as juveniles (Pouillard 2019). The level of imports is thus also explained by the fact that the zoo was “a place of perpetual death” (Flack 2018, p. 98).

The creation of the Stellingen Zoo by Carl Hagenbeck in 1907 has long been considered a turning point in the history of animal captivity. The site included several panoramas featuring animals in landscapes of painted concrete and concealing their captivity by replacing the bars with moats. The large panorama at Stellingen allowed visitors to look out over a pond, with a multitude of birds, and then over an African steppe, in the background of which was a lion’s rock, itself overhung by large rocks populated by mountain herbivores whose silhouettes stood out against the horizon. The sensation of immersion in distant landscapes and the illusion of animal consent offered by the panoramas met with immense popular success. Stellingen in turn became a model, imitated in most European and American zoos, many of which opened infrastructures directly inspired by

4. National Archives, Pierrefitte-sur-Seine, AJ/15/845, A. Milne-Edwards, *Rapport sur l’état actuel de la Ménagerie...* [1891].

5. From Zoological Society of London Archives, GB0814 QAA. *Daily Occurrences* 1865–2000.

Hagenbeck's installations (African plains, monkey rocks and so on) (Rothfels 2002; Ames 2008; Pouillard 2019).

However, at Stellingen, and later in other zoos, while the panoramas were attracting the attention of visitors, most of the animals were living in encyclopedic structures lining the cages. Panoramas, on the contrary, required the formation of groups of animals, often abruptly put together, according to transfers and arrivals, sometimes by placing phylogenetically related but geographically distant species together, as in the case of the herbivores from different regions of the world in the large panorama at Stellingen (Rothfels 2002, pp. 173–174). The artificial character of the groupings and the illusion of latitude offered to the animals regularly imposed new constraints on them: mutilations of birds to prevent their flight; training of big cats; placement in narrow lodges, mostly hidden from the view of visitors, at night or for management reasons (Loisel 1912, p. 318, p. 323; Baratay and Hardouin-Fugier 1998, pp. 250–253).

While the change offered by Hagenbeck at Stellingen with the panoramas was therefore largely a matter of spectacle and illusion rather than of the improvement of the condition of the captives, its influence was also marked in terms of health management. Hagenbeck valued the placement of animals in the open air in all weathers, while the confinement of animals from warm climates in facilities that were regularly stifling or too cold was the dominant model. The idea was promoted in other European zoos, in particular London Zoo, under the influence of scientists and pathologists who reached managerial positions at the beginning of the 20th century, and it fell into the emerging hygienist movement. The aim was to revitalize animal bodies degenerated by confinement, deformed by rickets and osteomalacia (softening of the bones), eaten away by parasites or consumed by tuberculosis, by giving them access to air and light. The placing of animals in the open air operated at a slow pace, and its effects were regularly fatal in cold weather in the absence of shelter and heated areas. It also remained uneven, being mostly granted to mammals and birds, right up to the present day (Pouillard 2019, pp. 179–184). However, an increasing number of individuals avoided permanent indoor confinement.

The body revitalization program encompassed many other aspects, such as improved nutrition, cage disinfection and veterinary care. All of this led to a gradual decrease in mortality in the best managed zoos from the beginning of the interwar period (Pouillard 2019). This clinical turn was accompanied, however, by a denudation of captive structures: many cages were bare spaces, lined with tiles and other materials ensuring a watertight environment and facilitating sanitation. The sight of destitute animals in empty cages brought about a resurgence in criticism, as old as captivity itself, from visitors.

1.6. Zoo ethics

The founders of the Jardin des Plantes menagerie intended to reconcile the exploitation and the liberation of animals. To solve this contradiction, they had represented the menagerie as a place of harmony between humans and animals, under the benevolent but firm grip of humans. However, beyond the intentions expressed in the founding texts, in front of the narrow, often unhealthy cages of the nascent menagerie, a number of visitors expressed strong criticism. The context was one of a development, since the 18th century, of sensitivities towards animals, under the influence of various factors, such as the rise of the relations of proximity with the pets and the “cult of tender-heartedness”, which, for humans, claimed the abolition of slavery and sentences of torture (Foucault 1975; Thomas 1985 (citation p. 229)). During the early decades, critics of captivity regularly used the vocabulary of imprisonment and slavery to describe the fate of animals (example: Jauffret 1798, p. 76, p. 84).

Throughout the history of zoos, reproaches have mostly focused on the modalities of captivity. Thus, it was that, in the 19th century and during the early decades of the 20th century, complaints about the parks were less frequent, except during the cold or humid months, when their occupants faced the bite of temperatures, without heating, or being bogged down in unsuitable soil. Criticism of the captivity of wild animals per se, which was long-standing and expressed, in particular, in philosophical and literary texts such as those of Montaigne or Rousseau, remained marginal (Rousseau 1969 [1755], pp. 111–112; Montaigne 2009 [1572–1580], p. 155).

The first animal protection organizations were established at the beginning of the 19th century. The most important of these, by reputation and number of members, such as the first protective society, the Society for the Prevention of Cruelty to Animals (1824) in England, or the Société Protectrice des Animaux (1845) in France, did not condemn captivity. Indeed, captivity corresponded with the ideal of animal acclimatization promoted by these associations in the 19th century, as well as the desire for proximity and physical contact with animals, including wild animals. From the 19th century to the present day, the activities of these associations have therefore focused on the modalities of captivity, drawing an evolving line distinguishing between “good” and “bad” zoos and calling for the latter to be closed or reformed, with the support of zoos placed in the former category (Baratay and Hardouin-Fugier 1998, pp. 208–210; Pouillard 2019).

However, beyond what separated the various critical expressions around captivity, most were formed in response to human perceptions of suffering

expressed by animals, both physical and mental (Baratay 2011). Certain animal behaviors polarized attention. At the beginning of the 19th century, a serval in the Jardin des Plantes menagerie had “not a moment’s rest”, made “prodigious jumps” and swung in a “peculiar manner [...] when not jumping”; he killed himself by hitting the ceiling of its cage. The polar bears of the institution had “a singular and perpetual movement of the head and neck, from top to bottom and from bottom to top”. Contemporaries, when questioning the causes of these behaviors, linked them to the conditions of captivity. Thus, polar bears must have “acquired this habit because the cage in which they spent their first year was too narrow” (Anonymous 1801, pp. 17–18; Cuvier n.d., p. 7).

From the middle of the 20th century onwards, within the context of the development of zoo psychology, and under the influence of the frequency of these so-called stereotypical behaviors and of the large proportion of individuals affected, research programs on the subject were set up. The insights provided confirmed the intuitions and empirical observations made by visitors and keepers from the very establishment of the zoo, while refining the established causalities. The zoologist and specialist in stereotypical behaviors Georgia Mason defines these as repetitive behaviors, devoid of apparent function, invariable and taking various forms depending on the species concerned (pacing, rhythmic rocking, self-mutilation, over-grooming, regurgitation and re-ingestion of food, licking of objects or supports and so on). They are caused by internal states associated with deficiencies in captive conditions, particularly frustration, fear, stress or lack of comfort. These internal states trigger persistent behavioral responses that are interpreted as deriving from attempts to replace a behavior that is impossible to perform under captive conditions, to escape confinement or more broadly to mitigate the difficulties of captive life. For example, pacing is regularly linked to unsuccessful attempts to escape (Mason et al. 2007, pp. 163–172).

The frequency of stereotypical behaviors, their striking character, especially in the most acute forms, such as self-mutilation, as well as the interpretation of lay people, which polarizes attention on the shortcomings of captivity conditions, prompted the cessation of the exhibition of certain species (such as gorillas and bears) in certain zoos from the last decades of the 20th century, as well as adaptations in captivity conditions (Flack 2016; Pouillard 2019). Beginning in the late 1970s, within a context of rising criticism of zoos (see section 1.7), staff at many institutions set out to develop and institutionalize “enrichment” programs, a term coined in 1978 to describe “any change to an animal’s environment that is implemented to improve the animal’s physical fitness and mental well-being”. The primary goals of enrichment “are to stimulate species-specific behavior, to increase activity, and prevent stereotypies” (Hosey et al. 2013, p. 251, p. 255). Enrichment

programs focus on developing occupational devices, including environmental, dietary, olfactory, auditory and tactile, for at least the most popular animals, often mammals, whose sufferings also appear most visible. While the most acute forms of stereotypical behaviors have disappeared in European zoos and the frequency and occurrence of these behaviors are decreasing, they remain endemic in captivity for a number of species (Mason et al. 2007, pp. 166–168; Birkett and Newton-Fisher 2011).

However, reforms aimed at diversifying the behavior of captive animals and the increasing attention paid to captive conditions were also a response to the desire to promote their reproduction, while criticism of their capture was increasingly strong.

1.7. Captive breeding

A cluster of factors promoted the deployment of criticism of zoos from the 1960s and 1970s. This was the time when colonial domination was being called into question, ecologist movements were on the rise, confinement in prisons or psychiatric clinics was being criticized, and the status of animals was being more vigorously questioned, supported by the publication of *Animal Liberation* by the Australian philosopher Peter Singer in 1975. Studies of “animal psychiatry” and reports on captive animals testified to the extent of their disorders. These visions contrasted with images of wild animal life in nature disseminated through the popularization of field research on animal behavior and the trivialization of wildlife documentaries (Baratay and Hardouin-Fugier 1998, pp. 236–237; Kean 1998, pp. 197–203; Traïni 2011, pp. 193–201; Singer 2015 [1975]).

At the same time, the number of private zoos was increasing, and with it the number of “bad” zoos decried by protection associations and traditional zoos. In 1969, the managers of the Zoological Society of London, the institution responsible for the London and Whipsnade Zoos, spoke of the proliferation of zoos, many of which were guilty of “neglect”⁶. The number of zoos in the British Isles had then increased from 65 to 95 in three years. In 1990, France had 324 animal parks, vivariums and butterfly greenhouses, many of which were created during the 30 years following the end of World War II (*Les Trente Glorieuses*). This increase in the number of private zoos was a direct result of the increase in the commodification of wild animals, to which it, in turn, contributed (Pouillard 2019, pp. 289–290).

In 1952, the rate of import of wild animals into Europe, mainly for animal traders and animal testing, was such, as was the harm done to the animals being

6. Zoological Society of London, *Annual Report 1969*, p. 16.

transported, that the Royal Society for the Prevention of Cruelty to Animals opened a facility at London Heathrow Airport to care for animals before they reached their final destination. In the early 1960s, this facility handled approximately 720,000 animals per year. The numbers increased in subsequent years, and, by 1977, the association had handled more than 16 million animals at this one entry point. In the 1970s and 1980s, the written press regularly published contributions on the traffic, especially during the arrival of dying individuals at airports. In Belgium, one of the European hubs of the wildlife trade in the 1970s and 1980s, campaigns led by animal protection associations and journalistic investigations made it possible to read and see photographs of dead and dying masses of animals left at Zaventem Airport, near the capital. Articles periodically questioned zoos, and certain animal protection associations were formed around this opposition to zoos and animal trafficking, such as France's Ligue Française des Droits de l'Animal (LFDA) (1977), which leaned towards abolishing the captivity of wild animals (Pouillard 2019, pp. 290–302).

The industrial commodification of animals also gave rise to an international legal response, aimed at regulating the trade, but not stopping it. The Convention on International Trade in Endangered Species of Fauna and Flora (CITES), or Washington Convention, which came into force in 1975, and which was transcribed into law in the United Kingdom in 1976, in France in 1978, and in Belgium later (1984), is a commercial regulatory instrument which governs the trade of species listed in its appendices through the granting of import and export licenses, which are only required for those species considered most threatened (Boisson de Chazournes et al. 2005, pp. 105–113). CITES, as well as other legal instruments regulating the import of wild animals, does, however, grant exemptions to zoos for the transfer of animals. Many zoos, especially those on the animals' continents of origin, served as a cover for the illegal trafficking of animals and became centers for laundering the captured, for example, by lying about the wild or captive origin of the animals. Some European zoos, including the most prestigious, at the same time continued to obtain supplies by occasionally resorting to poaching (Domalain 1975).

In spite of these flaws, the legal corpus encouraged a change in practices, motivated by the rise in criticism. A number of managers invested in a reform of the animal economy of their institution, enabled and encouraged by the increase in average longevity, itself supported by several factors, such as hygiene measures, nutritional improvements and advances in veterinary medicine for zoo animals. Captive breeding programs were developed, with increased attention paid to animal social organizations. Several buildings built from the 1960s and 1970s onwards for primates thus exposed a smaller number of species to allow the formation of pairs, then social groups aiming to imitate the social structures of the species. Management

programs increasingly took into account the effects of social stress, in particular to counteract the numerous maternal rejections and infanticides. For example, the role of conspecific rearing of young in developing social learning, and thus in providing the animals with the conditions to raise their own young, which had been demonstrated in primates since at least the early 1960s (Kortlandt and Kooij 1963), was gradually being taken into account in management procedures. Integrating animals into social structures that mimic their own, which decreases social stress, remains to this day “one of the most important, but most difficult tasks, to achieve in captivity” (Hosey et al. 2013, pp. 197–201, citation p. 199).

The development of captive breeding has also been based on the increase in the circulation of animals between zoos: exchanges have served to find internally, without recourse to capture, individuals that could best be matched according to elementary criteria of species and sex, and then increasingly refined criteria, guided by genetic determinants. Breeding loans, practiced since the 19th century, thus reached unprecedented dimensions from the second half of the 20th century. This intensification of transfers was based on the development of regional and international bodies bringing together zoos and zoo directors. It mobilized management tools such as studbooks, genealogical registers of animals used since the end of the 18th century for domestic animals. Studbooks became cardinal instruments for the transfer of zoo animals, especially when they became computerized from the 1980s to facilitate their demographic and genetic analysis in order to improve animal movements on this basis (Olney 2001). Studbooks in turn contributed to the establishment of regional and international captive breeding programs, which were started in the 1970s. Antwerp Zoo, for example, has, since 1977, been developing an exchange and breeding plan for okapi, a species for which it holds the studbook (Pouillard 2011).

The aims of captive breeding are, first, to ensure reproduction in captivity, but second to avoid inbreeding and to maintain a high level of genetic diversity over a long period of time – the classic goal of breeding programs is to maintain 90%–95% genetic diversity in a demographically stable population for 200 years (Hosey et al. 2013, p. 296). Some animals with genes deemed particularly interesting are therefore subject to regular transfers between zoos. Despite the care that accompanies these transfers, they partially replicate the social breakdowns previously inflicted by capture: in addition to being stressful for the animals, including socially, they may dislocate learning processes when conducted at an age younger than weaning, or when imposed on animals that do not experience separation in the wild, such as female elephants, who normally do not leave their mother or their natal group (Latham and Mason 2008, p. 85).

Captive breeding programs go hand in hand with redeployments of the control exercised over the animals through transfers and the use of medically assisted reproduction, developed with the help of reproductive sciences, and through procedures aimed at maximizing reproduction, which regularly involve invasive manipulations, such as blood sampling, laparotomies, endoscopies, sexing operations and monitoring of reproductive cycles and pregnancies. For the species for which reproduction is achieved, it is still a question of obtaining the desired size and composition of the herds, according to genetic, demographic or scenographic criteria. Birth control operates through contraception, sterilization, and more rarely through management culling, the slaughter of healthy individuals (Richardson 2003; Pouillard 2019, pp. 311–314, pp. 390–392).

The development of captive breeding, as well as the progressive decrease in the number of species presented in zoos, allowed a gradual but marked reduction in the number of specimens taken from the wild, starting in the 1950s and 1960s for mammals and birds, and a few decades later for reptiles and amphibians. Removal from the wild continues for less popular species that cannot be reproduced in captivity, which is the case for many fish (Pouillard 2019).

1.8. Capture and conservation

Captive breeding programs serve the development of a new function that zoos have endorsed since the 1960s: species conservation, which initially involved producing new captive animals from other, already captive animals in order to reinject them into the wild through reintroduction operations. However, reintroductions have remained marginal in terms of the number of species and individuals concerned, due to the difficulties of implementation. The conservation function of zoos was however institutionalized by the main international wildlife protection organizations, such as the International Union for the Protection of Nature (formed in 1948, renamed International Union for Conservation of Nature in 1956) or the World Wildlife Fund (1961, renamed World Wide Fund for Nature in 1986), who both participated in the definition of wildlife protection policies characterized by a close management of protected species and areas, with regularly invasive implications. This interventionist paradigm, which was crystallized at the end of the 19th century, particularly in the colonial field, led to animals being considered as parts (of species), then sums (of genes), rather than as individuals. The constraints imposed on captive animals have thus been justified in the name of safeguarding the whole to which they belong or the parts that constitute them, in other words, the greater good that should result for biodiversity (Pouillard 2019).

Such a program requires new catches, however sporadic. On the one hand, breeding programs need to be established. Among several examples: in 1970, the Zoological Society of London purchased 20 white rhinos from the Natal Game Department, captured from the Umfolozi Game Reserve in order to be installed at Whipsnade Zoo, a project financed by the World Wildlife Fund (Adams 2004, p. 135, p. 201; Pouillard 2019, pp. 366–367); in 2007, 15 crocodiles from the Philippines were imported to Europe to establish a captive breeding program aimed at their rescue⁷. On the other hand, the issue is to maintain sufficient genetic diversity in captive populations. Conservation biologists, particularly those specializing in population management of zoo collections, note that “immigrants from the wild should periodically be incorporated into the captive population if possible” (Ballou et al. 2012, citations p. 238). This is especially the case if the number of founders (animals captured from the wild, unrelated to each other, and who have reproduced) is small.

Despite the disengagement encouraged by critics, the conservationist programs themselves, increasingly globalized in scope after World War II due to the actions of international wildlife protection organizations, remain profoundly shaped by an understanding of animals marked by extraction and management under close human supervision, with deep historical roots.

1.9. References

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