



## Article

# A Landscape without Nonhuman Primates? The Case of the Barbary Macaque, *Macaca sylvanus*, (Linnaeus, 1758) and Its Interaction with Humans throughout Recorded Time

Cecilia Veracini

Centre of Public and Political Administration, Institute of Social and Political Sciences, University of Lisbon, 1300-663 Lisboa, Portugal; cveracini@iscsp.ulisboa.pt

Received: 30 June 2020; Accepted: 6 August 2020; Published: 25 August 2020



**Abstract:** Cultural and physical landscapes can be regarded as a result of the interaction among humans, nonhumans and a vast array of ecological factors. Nonhuman primates are our closest relatives and play a role in many cultural manifestations of mankind. Therefore interface between humans and other primates can create complex social and ecological spaces, new physical and cultural landscapes. This work, based on historical, artistic, archaeozoological, anthropological and biological data aims to review the history of the interactions between humans and the Barbary macaque since Antiquity. Adopting a cross-disciplinary approach, it will explore the Barbary macaque/human interface across history, with special emphasis on the cultural impact and influence this species has had on the different Mediterranean civilizations.

**Keywords:** history; natural history; ethnoprimateology; primate lore; trade; conservation

## 1. Introduction

Human–nonhuman animal interactions have constituted a fundamental connection in all societies throughout history (Pastoureau 2001; Kalof and Resl 2007). Studies of animals in past and contemporary societies have shown that perception of nature relates to human self-perception in several ways. “The animal world provides a rich thesaurus for the expression of fundamental social, moral-religious and cosmological ideas because animals are linked to human aspiration affectively, aesthetically, and intellectually” (Sterckx 2002, p. 3). Within the last two decades, we have seen the rapid growth of an interdisciplinary field that examines the complex and multidimensional relationships between humans and nonhumans. Today, several academic disciplines are questioning the ethical and philosophical grounds of human exceptionalism and reconsidering the animal presences hidden in the margins of history, anthropology, philosophy, sociology and literary studies (e.g., Fudge 2006; Brown 2010; Kirksey and Helmreich 2010; Taylor and Signal 2011; Corbey and Lanjouw 2013; Bovenkerk and Keulartz 2016; Keulartz and Bovenkerk 2016; Gross 2014; Malay 2018; Ohrem and Matthew 2018). Such studies developed mainly in relation to a series of broad, cross-disciplinary questions that comprises works in several fields of the social sciences, the humanities and the natural sciences (cf. De Mello 2012; Waldau 2013; Kalof 2017). Within this new—broad perspective, today’s cultural and natural landscapes can be regarded as the synthesis of interactions between peoples, places and nonhuman elements, both animals and plants, and reflect the reciprocal construction and circulation of knowledge and technology, the development, transformation and adaptation of humans’ societies across time and space, in different geographic and cultural contexts (Roque et al. 2020). The results of these complex interactions have shaped the lives of both humans and nonhumans, involving reciprocal adaptation and ecology.

Nonhuman primates (referred to as primates hereafter) are among the most representative animals of tropical and subtropical forest ecosystems. As seed and pollen dispersers, they play a fundamental role in the maintenance of forest diversity and dynamics (Chapman 1995; Sussman et al. 2013). Primates, our closest relatives, often evolved in close proximity to human societies and under similar ecological pressures, and can share ecologies that include cultural, historical, and physiological dimensions (Fuentes 2010). Therefore, interface between humans and other primates create and maintain complex social and ecological spaces, and create new physical and cultural landscapes. No other organisms on the planet share as much physiologically and behaviorally with humans, and this suggests that biological, phylogenetic, and behavioral overlaps between humans and other primates have a special significance, a special status and a distinct place in the human imagination (Corbey and Theunissen 1995; Fuentes and Wolfe 2002; Corbey 2005). They have played a role in religion, art, music and literature and other different cultural manifestations of mankind (McDermott 1938; Janson 1952; Groves 2008; Morris 2013; Cohen 2017), and were utilized for food, traditional medicine, human labor and even as sex slaves (see Alves et al. 2013; Veracini 2018). Throughout history, they have left their mark on fundamental notions and discussions of human nature and the origins of mankind, and have played a part in many human cultural and historical processes (cf. Haraway 1990; Corbey and Theunissen 1995; Corbey 2005; Barsanti 2009; Diogo 2018).

The natural and cultural landscapes of the Mediterranean would probably have been different without the presence of the Barbary macaque (*Macaca sylvanus*), also known as Barbary ape. This species, endemic to the North African forests, has been an emblematic and important animal both in North African, Western and Near Asian cultures since antiquity (McDermott 1938; Janson 1952; Groves 2008; Morris 2013). In North Africa, the complex relationship between humans and Barbary macaques has been shaped by a thousand-year history of interactions between this animal and the indigenous and incoming Mediterranean civilizations since Neolithic times. According to the various ethnic groups and religions, different symbolic meanings were attributed to this primate, influencing its distribution, treatment and conservation. Outside North Africa, the relationship with this animal expressed different types of discourse and different cultural interpretations; it had a place in daily life, myths, religions, science, economy, travels, art and commerce throughout the Mediterranean basin (Janson 1952; McDermott 1938; Masseti and Bruner 2009; Groves 2008; Greenlaw 2011, 2001; Mannert 2019; Veracini 2019). The species was widely exploited throughout all the historical periods, and this fact, associated with other more recent ecological factors, is now driving this species to extinction or to a very drastic reduction of its already reduced, wild populations (Waters 2014). The Barbary macaque has many peculiarities. It is the only macaque (Family Cercopithecidae) found in Africa (Groves 2005) and is characterized by the absence of a tail as in true apes (actually, it has a rudimental tail). It is the only primate indigenous to the Western Palaearctic, where it occurs further north than any other nonhuman species (Masseti and Bruner 2009, p. 40) and the only surviving primate in Africa north of the Sahara desert (Fooden 2007). The present distribution of the species is the remnant of a much more widespread population which, up to the last glacial episode, inhabited vast areas in Europe and Africa (Camperio Ciani 1986; Fa 1999). In the past, it was widespread throughout North Africa from Morocco to western Tunisia, but its current distribution is limited to small relict patches of cedar forest and scrub in mountainous areas of Algeria and Morocco (Fooden 2007; Mittermeier et al. 2013, p. 629). Moreover it is the only primate to live in Europe in free-ranging populations in the peninsula of Gibraltar and in semi-free groups in France (La Montagne des Singes, Wick, Kintzheim) and Germany (Affenberg, Salem). The Barbary macaque lives in great mixed groups of females and males, comprising up to 90 individuals. Troops are matriarchal, with their hierarchy determined by relationship to the lead female. Unlike other macaques, the males participate in rearing the young (Fa 1999). It is an emblematic species upon which was based the European idea of ‘the monkey’, its characterization as an animal, as a character and as the symbolic representation of ‘otherness’ in Western culture.

The fate of the Barbary macaque is the same as that of the other 60% of primate taxa, all threatened with extinction due to anthropogenic causes (Estrada et al. 2017). This situation has highlighted the

failure of the conservation policies carried out to date, leading conservationists to change their approach. One of the strategies adopted by conservationists during the past decade, besides biological studies, has included multispecies ethnography, which integrates socio-ecological data with local anthropogenic factors (Dore et al. 2017). Understanding the history of the exploitation of the species, and of its decline and occasional resilience, and incorporating the history of the local people's perceptions of animals is of relevance for contemporary issues and may improve the conservation of the species. A better knowledge of religious and ethnic history can help the comprehension of current local practices and attitudes towards animals. The study of the Barbary macaque offers the opportunity to understand: i. the ecological effects of millennial interactions and/or exploitation by endogen and hexogen human populations; ii. the results of these interactions and interconnections in the Mediterranean cultural landscape, offering also insights into the contemporary ethnoprimate issues in North Africa. This work, based on historical, artistic, archaeozoological, anthropological and biological data aims to review the history of the interactions between humans and the Barbary macaque. Adopting a cross-disciplinary approach, it will explore the Barbary macaque/human interface across history, with special emphasis on the cultural impact and influence this species has had on the different Mediterranean civilizations.

## 2. The Barbary Macaque or Barbary Ape, in History: Millenary Interconnections with Humans

### 2.1. Neolithic Period and Antiquity

The peoples endemic to North Africa seem to have interacted in some way with the Barbary macaque since the Neolithic period (ca. 5000 BCE). Camps (1990) observes that this species occurs in the archaeozoological inventory of the Neolithic Maghreb although it is never represented in the Rock Art of North Africa. This species, compared with the other endemic species of the Maghreb region, has a different profile. For example, animals that were heavily hunted such as the rhino, the elephant and the buffalo have rarely been found in the deposits of the Neolithic sites, but on the contrary, they are often represented in Rock Art. Others such as the wild boar (*Sus scrofa*), which is very frequent in the reservoirs, are only rarely represented. A cultural or religious filter has probably intervened, since Rock Art seems in general to ignore certain species such as hyenas or macaques, which must have been very frequently seen by these human populations (Camps 1990, p. 46). Archaeozoological interpretations of the possible meaning of the macaques' absence remain, of course, at hypothetical level due to lack of evidence. Did they have totemic significance, as is still the case in some contemporary traditional African communities? In other artistic productions such as those of the Sahara, which spans from Mesolithic to historical times, primates are also very poorly represented. Muzzolini (1989, p. 3) argues that in the artistic period of the Round Head paintings (9,500–c. 7,000 BP) of Acacus in the southwestern part of Libya, primates (*Papio anubis* and other cercopithecidae) could have been regarded as symbolic animals.

Signs of Barbary macaque presence outside its natural habitat began to be detected in the 8th century BCE after the Phoenician expansion in North Africa around the 1st millennium BCE. The city of Carthage was founded in 814 BCE and grew powerful on trade in the Mediterranean areas and outside. It seems not unlikely that Phoenicians should have traded products of North Africa including animals. The Italian peninsula and its islands were involved in the commercial network established in the central Mediterranean in the course of the 9th century BCE by the Phoenicians and the Greeks from Euboea. Their commercial network connected the African coast with central Italy, Sicily and southern Sardinia (D'Oriano 2007). Although no archaeozoological remains of the Barbary macaque were found outside Africa in this historical period, one monkey, at least, roamed the territory of Iron Age Sardinia in the course of the 9th–8th century BCE, as attested by the bronze figure decorating a lamp, now displayed at the National Archaeological Museum of Cagliari (Mannert 2019, p. 21). This tailless monkey was also the source of many Etruscan representations made locally in ancient Etruria. Figurines and other monkey-like objects were diffused throughout the area of Etruscan

influence from the 7th century BCE, at least for more than one century (Bonacelli 1932, p. 372). The Italian historian Bonacelli (1932, pp. 368–69) notes that some of these objects (Figure 1) could have had talismanic significance related to a sort of sacred value being attributed to the Barbary macaque, and this symbolic role could have been transmitted by the Phoenicians/Carthaginians



**Figure 1.** Central part of an Etruscan belt, Albegna, Italy (from Bonacelli 1932, modified).

This author also argues that the Etruscan word for monkey (*arim*) specifically refers to the tailless *M. sylvanus*. Other facts such as the intriguing name of *Pithecosa* given by Greeks to an island in the Gulf of Naples (today Ischia) already in ca. 775 BCE could be linked to the trade in Barbary macaques. One of the interpretations—not confirmed by any archaeological evidence—is that the name derives from the Greek word *pithekos*, meaning tailless monkey or prankster (Bonacelli 1932, pp. 356–57; Bonfante 1992; Mannert 2019, p. 23). This hypothesis assumes that the first Greek settlers perhaps found a colony of monkeys on the island—although no free-ranging or wild populations of monkeys are known to have ever inhabited Ischia, either in very ancient or in more recent times. Gras (1994) argues that monkeys were transferred there, together with the cult for a zoomorphic divinity with the aspect of a monkey, by seamen within the Phoenician and Euboean circuits. Thus, the toponym *Pithecosa* would mean the ‘isle of monkeys’ (Bonacelli 1932, p. 358). Around the 5th and 6th centuries BCE, some more depictions of monkeys appeared in Italy on Etruscan tombs. The *Tomba della Scimmia* near Chiusi and the *Tomba Golini* at Orvieto, dated 450 and 400 BCE respectively, depict Barbary macaques. The contexts in which they are situated suggest that these monkeys were probably either the pets of the people buried in the graves, or their images were used as ornaments for plays and games in honor of the dead (cf. Bonacelli 1932). Carthaginians are also known to have traded as far away as southwest England for tin, a component of bronze which sustained their technology. At Navan, in Northern Ireland, was found a well-preserved skull of a Barbary macaque dating from probably “about 25 years on either side of 150 BC on stratigraphic ground, supported by a radiocarbon date of  $2150 \pm 70$  BP”, the skull being most likely of Carthaginian (or Roman) origin (Groves 2008, p. 24).

The early trade in Barbary macaques across Mediterranean Sea, apparently begun by the Phoenicians, continued in the following centuries until the destruction of Carthage in 146 BCE by the Romans (Goudsmit and Brandon-Jones 2000). In the Egyptian Baboon Catacomb at North Saqqara, many Barbary macaques together with the Olive baboon (*Papio anubis*) and the vervet monkey (*Chlorocebus aethiops*) were buried in the Lower Gallery of the Baboon Gallery, dated on the basis of palaeographic evidence to the period 180–160 BCE (Goudsmit and Brandon-Jones 2000). According to the authors, this suggests a partial shift in primate species mummified by Egyptians, and appears to reflect a change in their trading pattern, from predominantly Nile and Red Sea traffic towards the Mediterranean coast of Northwest Africa. The Phoenicians appear to have presented the Egyptians with increased numbers of macaques, transported from the West Mediterranean to Alexandria following the defeat of Hannibal in 202 BCE by the Romans. This monkey trade apparently stopped with the destruction of Carthage. As reported by Groves (2008, p. 26), who studied some of these animals, the macaques and baboons had been in a poor state of health: almost all suffered from osteoporosis and had some periodontoclasia, often leading to actual tooth loss. Many of them were adult or subadult specimens, suggesting that despite the bad conditions they suffered in captivity, they were able to survive for some years.



A close relationship between the Carthaginians and the Barbary macaque is also attested by written sources. According to the Roman writer Diodorus Siculus (ca. 90 BCE–27 BCE), the Barbary macaque did have a sacred value in some Algerian territories, where they were neither hunted nor eaten. In his description of the expedition of Agathocles (tyrant of Syracuse, Sicily) against the Carthaginians in 310 BCE, he told of the capture of one of the three so-called monkey-cities by his lieutenant, Eumachus. These cities were probably located west of Carthage (though their exact location is unknown) and abounded in monkeys. For this reason, the Greeks named them *Pithecusae*, that is “the cities of monkeys” (cf. [Gillies 1820](#), p. 211; [McDermott 1938](#), p. 58).

“In these cities many of the customs were very different from those current among us. For the monkeys lived in the same houses as the men, being regarded among them as gods, just as the dogs are among the Egyptians; and from the provisions laid up in the storerooms the beasts took their food without hindrance whenever they wished. Parents usually gave their children names taken from the monkeys, just as we do from the gods. For any who killed this animal, as if he had committed the greatest sacrilege, death was established as the penalty. For this reason, among some there was current a proverbial saying about those slain with impunity that they were paying the penalty for a monkey’s blood” ([Diodorus Siculus 1954](#), Book XX, s58).

Moreover, the Greek Timotheus of Gaza (active during the reign of the Eastern Roman Emperor Anastasius, 491–518 CE) in his work *De animalibus* (cf. [Bodenheimer and Rabinowitz 1949](#)) speaking of Numidia (which roughly corresponded to the north part of present-day Algeria) and Mauretania (in modern times Morocco and Algeria) said that monkeys were there honored as highly as in the “cities of monkeys”. Strabo (60 BCE–23 CE) also speaks of the large number of monkeys in Mauretania, and quotes a passage from Posidonius of Rhodes who, on a voyage passing the coast of Africa, saw a large number of these animals. Of these, some were in trees, some on the ground, some were suckling their young, some exhibited various signs of disease ([Strabo 1902](#), vol. XVII, p. 827). The worship of macaques apparently did not prevent the people from capturing them and trading in them, at least in the coastal areas of Phoenician influence. The relationship with these animals could perhaps have been different in the mountainous Algerian areas of Kabyle, where the Berbers lived in close contact with these animals. A more respectful type of relationship was found in these areas by the anthropologists and maintained until the first decades of the last century ([Joleaud 1931](#), see later).

In other areas of ancient Numidia, a different attitude to *M. sylvanus* is reported by the ‘father of history’, Herodotus (c. 484–425 BCE). The scholar mentions people called Zayeces and Gyzantes and their custom of eating monkeys ([Herodotus 1920](#), vol. IV, pp. 193–94; [McDermott 1938](#), p. 57). These populations, called also Byzantes in other sources ([Mannert 1842](#), p. 661), were probably nomad Berber tribes who lived in the territories south of Carthage, in what is now Tunisia (cf. [Joleaud 1931](#), p. 134; [Wheeler 1854](#), pp. 554–56). According to Herodotus, “They painted themselves red and fed on the meat of monkeys that the nearby mountains provided in abundance; they collected honey from numerous wild bees’ nests, but also produced it.” These populations lived in the mountain range which cuts through Tunisia in a south-west direction and which extends from the mountains of Tébessa to the border with Algeria, known as the Tunisian ridge ([Mannert 1842](#), p. 661).

In the Greco-Roman world, the Barbary macaque was probably a fairly common animal. Artistic, literary and archaeozoological data testify to the Barbary macaque’s presence in the Greek world and then throughout the Roman Empire until 6th century CE. Most of this evidence shows that the animal was either kept as a household pet ([Bailey et al. 1999](#), see Figure 2), shown off as an exotic rarity, used for entertainments ([McDermott 1938](#); [Masseti and Bruner 2009](#); [Thomas 2018](#), p. 367) or even served as a military mascot



**Figure 2.** Two Barbary macaques' representations of a Roman marble relief found in *Via della Foce* at Ostia, Parco Romano Ostia Antica, (21 × 54 cm) dating from the second century CE.

(Guardia et al. 2005; Masseti and Bruner 2009, p. 40). Indeed, *M. sylvanus* is the only Primate species found, to date, in the Roman European archaeological context: it was found in Italy, England, Spain and France. In a tomb found in the archaeological Gallo-Roman site in France, a Barbary macaque was buried inside the tomb enclosure of the family, suggesting that this animal was not considered a mere exotic rarity but a true member of the family (cf. Gerber and Baudry-Dautry 2012). According to Roman law, only close relatives, emancipated young people and heirs could be buried in the family tomb; thus, the monkey could be regarded as a component of the *familia*, in the Roman sense. Yet, the role of pets in the Greco-Roman world is not yet fully understood and seems to have been very different from what we mean today (cf. Calder 2018; Franco 2018).

Primates are also frequently evoked in Greco-Roman literature, which refers to 'the monkey' in the abstract as a general compound of all simian characteristics, but which, in fact, was usually synonymous with the Barbary macaque. This animal was an object of parody due to its similarity with human beings (cf. McDermott 1938; Calder 2018, p. 77). This aspect made the monkey a ridiculous character with ambiguous and, in general, negative traits. The references are loaded with moral meaning, especially because this animal was considered the liar *par excellence* among animals: a low-born demagogue which pretended to high birth due to its intermediate nature between that of the other animals and that of mankind. Fables, plays and proverbs, but also other literary works, contributed to the creation of an extremely negative and almost diabolical portrait of these animals (Greenlaw 2011).

The Greek scholars were the first to produce a scientific description of the Barbary macaque. Aristotle (384–322 BCE), in his attempt to classify primates (cf. Aristotle. 350a BCE, Books: II, Part 8, 502a 17-b; VIII: 502a 17-b; Aristotle. 350b BCE, 689, b31) referred to a tailless monkey as a *πίθηκος* (*pithekos*), Latinized as *pithecus*. The Barbary macaque is the only primate he knew without a tail (i.e., with a vestigial tail), and the name *pithekos* seems to refer mainly to this species (Latin authors used the term *simia*). This word has an unknown origin, but as reported by Groves (2008, p. 40), its origin could have proto-Berber–Chadic roots in some period before 2800–2500 BCE. Aristotle gave a detailed description of the primates he knew, considering them intermediate species between us and the other animals (*Historia animalium*, Book II, 8–9 (502 a–b). For instance, monkeys (that is, the Barbary macaque) do not have a tail, resembling, from this point of view, the anatomical structure of human beings, but at the same time, they are similar to other mammals in not being provided with gluteus muscles. The evidence he presents, shows that he probably relied on first-hand knowledge, mainly based on the Barbary macaque (McDermott 1938, p. 104). The Greek physician Claudius Galen (110–210 BCE), after dissecting primates, assumed that the internal structure of humans was the same as that of simians. Although it is not unlikely that he used for his studies various species of primates (cf. Galen 1956, Book VI), contemporary anatomists are not of this opinion, and maintain that the Barbary macaque was probably the only species used by Galen for his dissections (cf. Alghamdi et al. 2016; Diogo 2018). Interesting in his work on anatomy, Galen rejects the vivisection of primates, defining it an "hideous spectacle" (Vespa 2018, p. 428). As Vespa (2018, p. 409) observes often, "Galen uses an alternative

name for monkey: ‘the handsome one’, which was a euphemistic and auspicious term counteraction the otherwise presumed inauspicious nature of primates, at least according to ancient Greek folklore.” The impact of Galen’s dissections, and of related topics such as the extent to which primates resemble human beings in all their internal parts, influenced Western and Islamic anatomy right up to the Renaissance, leading to many misunderstandings (Diogo 2018).

## 2.2. Europe in the Middle Ages

The species of nonhuman primates that appear in Medieval Europe and which can be identified from iconographic sources are practically the same as those which arrived in Europe during the classical period. Written, artistic and archaeological sources reveal that the Barbary macaque was the most common primate species in Medieval Europe (Kahlow 2018, p. 89) and perhaps the only one familiar in Europe until the 12th century. It was, in fact, with the resumption of trade in this century that other exotic animals began to pour with more frequency into Europe.

In medieval Europe, exotic animals were highly esteemed. They were valued, and seen as emblems of distinction by the élite: symbols of grandeur creating an image of personal and dynastic power (Santana Simões 2014, p. 524). Primates played the role of expensive, high-status pets, and were fairly commonly found in the possession of rulers, aristocrats and high prelates; if not closed in *menageries*, they seem to have lived relatively freely in houses and castles (Buquet 2013, p. 101). They were among the favored pet species, together with small dogs, cats, birds, squirrels, ferrets and rabbits (Walker-Meikle 2012, p. 24). As pets, monkeys could be attached to leashes like dogs, or, instead of keeping monkeys all day on leashes or chaining them to walls, people used to restrain their movements using a heavy block or ball, as was done with human prisoners (Buquet 2013). Although attention and care was lavished on the animals because of their rarity, their level of stress due to their being in captivity and being given unsuitable nutrition was likely to be very high. Remains of Barbary macaques often reveal signs of enamel hypoplasia, a condition that may arise as a result of malnutrition and lack of exposure to the sun, which can result in a deficiency in vitamins A or D (Pipe 1992, p. 190). For this and other motives, monkeys often died young, although adult animals were able to survive in a very cold climate.

In the medieval imagination, monkeys were common animals which figured in art, bestiaries and all literary genres (philosophic, popular and sacred). Among the numerous functions and symbols assigned to them in medieval culture, none embraces a wider range of interpretations from the sublime to the ridiculous as its emblematic role in figurative arts (cf. Janson 1952). These animals were depicted in many ways according to the cultural changes in society and to their direct contact with people, which had a great influence on European lore and perceptions regarding monkeys. The concept of ‘the monkey’ (which has its roots mainly in the Greek world) found in bestiaries and in religious and scientific treatises did not refer to a species in particular, but the features of the Barbary macaque are those that appear most commonly in medieval art and literature (e.g., manuscript marginalia of Book of Hours, or Latin manuscripts of the Gothic period).

Already seen by Greeks as negative and evil creatures which bore many of the vices that afflicted humanity, the monkey became, in general, the symbol of a degenerate humanity, tempted to sin by the devil. This association with the devil was resumed and emphasized in early Christianity: the patristic texts reworked the Hellenistic works in the light of Christian beliefs. The term *simia* becomes pejorative and associated with the pagan, the apostate, the heretic and the infidel (McDermott 1938, p. 63). The *simia* was identified with the Barbary macaque, which was guilty of not having a tail: it “has a beginning, but no end (tail)”, “the ape, not having a tail is without species, and his rear, without a tail is vile; like the devil, he does not have a good end” and this form revealed the evil influence of the devil (cf. Janson 1952, pp. 17–19). The Lord, according to Leviticus 22:23 (Bible, 2020) declared the tail to be a necessary part of every animal by pronouncing those defined unfit for sacrifice. The nether-end of animals was determined by God, so that it was against nature for any animal to be tailless (Janson 1952, p.19). According to patristic literature, one of the most important qualities of the

devil is his unceasing ambition to imitate God, and he eventually came to be known as *Simia Dei* (cf. Rudwin 1931, p. 120), that is, the devil mimics the Creator, he wants to put himself in his place but with poor and horrifying results.

The first monkeys in Christian art were, therefore, malignant creatures, and the ‘monkey’ here meant the tailless *M. sylvanus*. The association between the devil and this species did not, however, last long, because it were far from demonstrating devilish behavior, and so by the end of the Middle Ages, the concept of the monkey as a sinner and victim of the devil had come to the fore: it would pay for its carnal appetites in forgetfulness of God, and would face an eternity of torment and torture. The forbidding image of the ape as *figura diaboli*, though, persisted in the textual tradition of the Bestiaries up to the 14th century and later, despite the fact that there are very few artistic representations of the monkey-devil in Romanesque art of High Middle ages (Janson 1952).

The Islamic expansion in North Africa up to about the 8th century probably favored the use of the Barbary macaque for street entertainments. This activity was historically very common in the countries of Arabic influence of the Near East and North Africa (Viré 1986). The Islamic religion had a complex relationship with primates (Veracini and Alghamdi), but one of the common viewpoints considers these animals negative and impure—*haram*—animals. Apparently, no restriction was applied to the use of, and trade in, these animals, and Barbary macaques followed the Muslim conquest in Europe. It is at this time that the colony of Gibraltar was probably founded. Gibraltar, a British possession in the Iberian peninsula since 1704 (Zeuner 1952), hosts the oldest established colony of free-range monkeys in Europe. About 300 Barbary macaques distributed in five social troops live in the Upper Rock area of the Gibraltar Nature Reserve (Figure 3).



**Figure 3.** A young specimen of *M. sylvanus* of the Gibraltar colony (Photo by Cecilia Veracini).

Although the origin of this colony is still controversial, the first macaques’ nucleus could have been introduced by the Moors under the Saracen Tariq, who captured and fortified Gibraltar in 710–711 CE (Masseti and Bruner 2009, p. 41; Shemesh 2018). However, “since no mention of monkeys is made during the period of Spanish occupancy between 1492 and 1704, it is possible that the Moorish importation died out, subsequently being replaced by new stock” (cf. Masseti and Bruner 2009, p. 41). An interesting Moorish tradition claims that the animals came over from Africa by an underground passageway (Garcia 1979, p. 24; Ryan 1999, p. 25). The Upper Rock macaques are today regarded as talismanic animals by the authorities of Gibraltar: the colony will remain British as long as the macaques exist (Garcia 1979, p. 8).

A recent study by Shemesh (2018) shows that even among Algerian Jews, “there was no call for prohibition against the trade in monkeys!” The author, using a *responsum* of R. Shimon ben Zemah Duran, a Jewish halakhic adjudicator who lived in Rashbatz, Algeria, in the 15th century, shows that the trade in monkeys practiced by Algerian Jews was a common practice and that it had deep roots in



the past. Trade in monkeys had been forbidden in ancient times by the Mishna sages, who were against trading in non-kosher animals, but R. Shimon ben Zemah Duran permitted trading in monkeys, basing his ruling on ancient sources in rabbinical literature. This was not “a new issue in the economic life of Algerian Jews”, because his own family also dealt in the monkey trade (Shemesh 2018). This merchant was apparently Spanish, and may have engaged in this field even when living in Spain and Mallorca. It was from Béjaia, a port on the Mediterranean coast, that the merchant arranged the sale of monkeys, as his father and grandfather had done. Moreover, in Algeria, it seems that monkeys at that time were used for purposes of entertainment and as a status symbol.

### 2.3. Modern Period

The European demand for exotic animals stimulated by the European expansion of the 15th and 16th centuries resulted in growing imports of animals from other continents. Recent evidence suggests that this period coincides with the first global trade of primates (Teixeira and Papavero 2010; Veracini 2011, p. 217). In Early modern times as in previous centuries, exotic animals continued to be used as representations of social standing (cf. Ringmar 2006; Gschwend 2017). Exotic pets such as parrots and monkeys became very sought-after animals for rulers and wealthy people of Renaissance Europe. The huge trade of primates meant that many species of primates became quite common in residences and ‘menageries’ as revealed by historical and iconographic sources (Masseti and Veracini 2010; Teixeira and Papavero 2010; Masseti and Veracini 2014; Veracini 2011; Veracini 2017). The Barbary macaque could appear as a ‘common monkey’ to European eyes compared to the other animal novelties. Yet, also in this same period, this primate species was already part of the European cultural landscape. Records of their presence in Renaissance Europe include written sources, depictions, naturalistic and scientific representations and archaeozoological remains. According to the iconographic sources, this species was present in all the main Renaissance courts in Italy such as the Medici in Florence (Masseti 2018), the Gonzaga in Mantova or the Sforza in Milan (pers. obs.). It was portrayed also in the Venice Republic by Carpaccio and even by Michelangelo in one of his sculptures named “*I prigionieri*”—currently at the Louvre Museum—being also common as a pet in the North of Europe. Its role as a pet seems to cross different classes and status, such as rulers, merchants and different ethnicities as shown by a detail of the panel 3 of North door by Lorenzo Ghiberti of the Florence Baptistery (pers. obs.).

The European cultural assimilation of exotic animals was reflected in the entire cultural medium of Early modern Europe, in particular among figurative arts and literature. The massive importation of African and Neotropical primates and the knowledge acquired on these animals through the reports of travelers and missionaries, contributed to the gradual change of primate perception and lore in Europe (Veracini 2011; Veracini and Teixeira 2017). The many different iconographic meanings and lore of Renaissance monkeys’ depictions, denote a changing conception of these animals: from negative and evil creature to a symbolic example of freedom (e.g., Durer, *The Dance of Apes*), and to a great array of different meanings related to the contexts in which the primate is inserted (Veracini 2011). Notwithstanding, monkeys continued to be used as a metaphor of sinner. However, positive meanings were also put across and the same animal could be attached to both a positive and a negative meaning. According to Cohen (2017), it was in the late 16th and 17th century that primates’ illustrations of monkeys (‘apes’) seem to definitely abandon the past lore and monkeys became the mediators between the artist and art: “The artist tends not only to empathize with animals but also to identify with them.” Thus, the monkey “became a metaphor of the universal artist and clever imitator of nature”, *Ars simian naturae* (Cohen 2017).

The 16th century treatise Della Porta (1586), by the alchemist and naturalist Giambattista Della Porta, is an example of how much the discourses of the past on monkeys were still present in the Early modern period. His work includes engravings of famous men, and men’s body features were frequently compared with those of animals to describe men’s demeanor and character. In one engraving (Della Porta 1586, p. 61), a man is compared to a monkey, clearly a Barbary macaque. The man shows

very small ears comparable to those of the monkey. This feature in men, according with the character of the monkey who has small ears, “is an index of bad habits, lust and of thieves.” The author also quotes Aristotle and Galen as proof of his theories. Additionally, in the work of two of the most important naturalists of the second half of the 16th century, the description of the Barbary macaque includes moral attributes as in the previous period. Here, the animal is a representative of simians, a general category which could broadly correspond to today’s Infraorder Simiiformes or Anthroipoidea, and still carries the heavy burden of legends, myths, conjectures and behaviors rooted in the ancient world and the Middle Ages.

In his *Historia animalium* or *Thierbuch* of 1551 and successive editions, the Swiss physician and naturalist Conrad Gesner (1516–1565) begins the discussion about monkeys with a chapter called “*Simia-Ein Aff*” [monkey, in German], opening with a *M. sylvanus* picture (Gesner, 1551). This chapter, differs from the remaining chapters dedicated to specific types or genera of primates, is a general description of what were considered to be the primates at that time. It also concurs to some extent with the Barbary macaque’s description, in an ambiguous and unresolved taxonomic category. The other chapters are dedicated to the dog-faced monkeys (baboons) *Cynocephali*, to tailed primates of different genera *Cercopithec*i, *Cepus*, *Callithich*es among other fabulous creatures. The Italian encyclopedic naturalist Ulisse Aldrovandi (1522–1605), in the books *De Quadrupedibus Digitatis* published posthumously in 1637 (Aldrovandi 1637), also followed Gesner’s interpretation of the *Simia* as representative of all the primates he knew, and described the specific species/genera in distinct chapters (Veracini 2012, p. 2019). Both authors classified primates following the classical Aristotelian interpretation, attempting (especially Aldrovandi) to update his work, using widely the new reports acquired through the expeditions in other continents, the correspondence with other naturalists, and first-hand observation (Veracini 2019, p. 54). However, in the chapter on the *Simia*, there is still the appeal to Classical and Medieval authors likely justified by the authors’ desire to be as complete as possible in their citations. Hence, judgments about the moral value of the animals and their symbolical role were still present, particularly in the chapter on *Simia*. Alongside the freshly new naturalistic descriptions of the New World monkeys who were reaching Europe, we find excerpts such as this of the Roman writer Quintus Ennius (3rd century BC): *Simia quam similis turpissima bestia nobis* [the monkey, ugly animal, how like ourselves] (Aldrovandi 1637, p. 226).

Aldrovandi’s lists of the names used in the different languages for the *Simia* are in part coincident with that of the tailless *M. sylvanus* and are still used today:

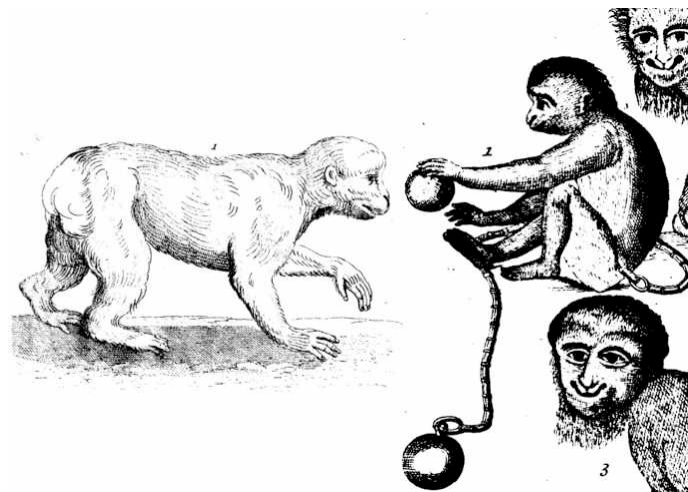
This beast is called *Koph* by Jews and, when there are many, *Kophim*; the Chaldeans call it *Kophim*, and Aristotle *pithecos*. In the ancient Etruscan language, it was called *Arimo*; the noun *Inarime* refers to the Island of the Monkeys, a fortified island; the Moors call this monkey *Bugio* [ . . . ], the Spaniards *Mona*, or *Ximio*, In Italy it is called *Simia* or *Bertuccia*, in France *Singe*, in Germany *Aff*, in England *Ape*, and in Flanders it is called *Sime* (De QDV: 226). (Aldrovandi 1637, p. 58)

Particular interesting is the word *Bugio*, used according to Aldrovandi by North African populations as a name for the Barbary macaque. The word *Bugia* is the old Roman name of Béjaia, a city in the territory of present-day Algeria. From there, Romans brought a lot of wax and for this, the same name means Roman candle. The territory was famous in antiquity for caring for and venerating monkeys, but later became a trading spot of these animals, as we have seen. Therefore, the Portuguese of the 15th and 16th century used this word to name all kinds of monkeys (Veracini and Teixeira 2017). One of Aldrovandi’s watercolors (see *Tavole Animal*i, vol. I. 2, p. 109, <http://aldrovandi.dfc.unibo.it/> Figure 4) portrays a specimen of *M. sylvanus*, labeled: *Simia Pithecos*. Indeed, the name chosen by the author seems particularly appropriate: *Simia* (later a Linnaeus’ genus) defines the broader category of monkeys while *pithecos* refers to a specific feature: no tail.



**Figure 4.** The Aldrovandi's *Simia Pithecos*. *Tavole Animalium*, vol. I. 2, p. 109, <http://aldrovandi.dfc.unibo.it/> (© Alma Mater Studiorum. Università di Bologna—Biblioteca Universitaria di Bologna).

Although Aldrovandi had appropriately given a correct scientific description of the Barbary macaque, at least in the *Tavole*, it would take an additional 300 years for this species and its geographical range to be correctly identified (cf. Fooden 2007). A work of the Venetian physician and botanist Prosper Alpini (1553–1616)—appointed consul in Cairo in Egypt by the Republic of Venice where he spent a period of three years—had a significant influence on the naturalists of the 17th and 18th centuries. In his treaty, *Historia Naturalis Aegypti*, Chapter XI, *De variis simiarum generibus in Aegypto observatis, & primo de Cynocephalis vocatis* (Alpini 1592, p. 240), Alpini describes the primates he observed in those lands, obviously all in captivity because as he himself comments: “no species of *simia* is born in Egypt.” He distinguishes two kind of monkeys: the bigger one, *Cynocephalus*, and the smaller, *Callitrichis*. Among the “*Simiae Cynocephali*”, he includes the Barbary macaque and includes engravings of specimens, drawn probably from live specimens that he managed to bring to Venice (see Figure 5). These adult specimens, he accounts, had the size “similar to that of English dogs” and were “very cruel, unfaithful, and wild”, “even though they are very hilarious and easily disciplined animals.” In other tables of Alpini’s work, there are two drawings of a tailless monkey with anthropomorphic features, probably drawn from Alpini’s description, also called “*Cynocephalus*”, which must have been “milder in nature” according to the author. In another table which portrays other cercopithecids called *Callitrichis* (other cercopithecids), a chained young specimen of Barbary macaque is found (Figure 5). Alpini was not a zoologist and he may not have recognized the relationship between a young one and an adult, a fact not new in zoology, especially in the identification of exotic species. The taxonomic multiplication of *M. sylvanus* produced by Alpini echoed greatly in the natural history of the next centuries, influencing naturalists such as Linnaeus and Buffon.



**Figure 5.** Engravings of the Barbary macaque by [Alpini \(1592\)](#). *Historiae Aegypti Naturalis*. Right side: the great *cynocephalus*, left side, the small *cynocephalus* (chained).

To the Swedish naturalist Carl Nilsson Linnaeus (1707–1778), the genus *Simia* included what we call today nonhuman Simiiformes, divided in three informal groups ([Groves 2008](#), p. 92). One of these groups is composed by primates without a tail, called *Simiae veterum* (the *Simia* of the Ancients) and included the Barbary macaque, *Simia Sylvanus*, and the real great apes (cf. [Linnaeus 1758](#)). The name *Simia Sylvanus* was based on several sources, all of which denote the Barbary macaque ([Groves 2008](#), p. 93). The other great naturalist of this century, the French Jean Leclercque Buffon (1707–1788), described the Barbary macaque according to a different idea of classification which did not contemplate a hierarchical classification system ([Buffon 1766](#), vol. XIV, pp. 1–17). To Buffon, the word *singe* (*simia* in Latin) means at the same time a specific group of animals without tail (apes) and the whole Order Primates (*sensu* Linnaeus but without humans): “I call *singe* an animal without tail, whose face is flat, whose teeth, hands, fingers and nails resemble those of man, and who like him walks erect on two feet.” This group included the “*pithecos* of Greeks”, and the “*simia* of Latins”, “and it is on this that Aristotle, Galen and Pliny based their physical comparison between man and monkey.” Therefore, according to Buffon, the *pithecos* corresponded to a not well identified “pygmy”, “whereas the *cynocephalus*, well known to the Greeks and Romans corresponded to the “*magot*” (= *M. sylvanus*) According to some authors (e.g., [Gervais 1854](#)), Buffon was right when he affirmed that Aristotle used the word *cynocephalus* to also refer to *M. sylvanus*, or rather to adult male specimens of this species; the *pithecos* corresponded instead to females and young of the same species.

Linnaeus, as did Buffon, updated his work constantly particularly by consulting the work of other naturalists who were describing new primate species. Thus Linnaeus, in his 12th edition of the *Systema Naturae* ([Linnaeus 1766](#)) added, among others, a new species without tail: *Simia Inuus* (= *M. sylvanus*), distinguished by insignificant details from *Simia Sylvanus*, on the basis of the Alpini’s work. It corresponded to the Buffon’s *magot*. Still the 13th posthumous edition (cf. [Gmelin 1788](#), pp. 27–28) sees the persistence of the redundant *S. Sylvanus* and *S. Inuus*, synonymous of the Barbary macaque. To Buffon, the *magot* (to him, *cynocephalus*) was scattered across all the warm climates of the Old continent and in Tartary, Arabia, Ethiopia (sub-Saharan Africa), Malabar, Barbary, and Mauritania ([Buffon 1766](#), vol. XIV, p. 112). Later, the French naturalist admitted that the tailless pygmy of the Ancients observed in Algeria had a strict similarity with the *magot*, but still was a different species ([Buffon 1789](#), p. 30). Moreover, confirming the confusion regarding the correct identification of this species, he adds to the macaques’ list the tailless “*petit cynocephalus*” described by Prosper Alpini (see above). Nevertheless, Buffon gave a detailed naturalistic description of the Barbary macaque, including external measurement and proportions, pelage coloration and other physical characteristics such as “the small portion of skin which seems a tail, his cheek-pouches, the large prominent callosities



on his buttocks, the canine, teeth longer than those of man and noted the females are subject to periodical discharge." He also noted its behavior in captivity, observing the specimen he himself kept in his Montbard's domain in Paris. The poor animal was kept in an unheated room, even in winter and always chained "because though he had been long in a domestic state, he was not civilized and had no attachment to his master" (Buffon 1766, vol. XIV: pp. 133–34). He observes that "he was always melancholic and sometimes dirty. He used the same grimace to mark his anger, or to express his appetite. His movements were brisk, his manner gross and his aspect more ugly than ridiculous." To him, although "it was more similar to humans than other monkeys such as the baboons", "a simple comparison of their behaviors was enough to show man's superiority over animals and monkeys"—with argumentation such as "men can speak and animals cannot although they have the vocal organs as is shown by the monkey or the parrot"; "they do not invent anything [ . . . ] they are purely material."

Buffon's description, which underlines the ferocious and mischievous Barbary macaque's character, is perhaps one of the last legacies, at least in the natural sciences, of a negative symbolism attributed to this species. At that time, natural science and the entire Western world were beginning to become seriously concerned about other "tailless primates": the real apes. The anthropoid apes first entered in contact with Europeans in the 16th century expeditions into Western Africa (Veracini and Casanova 2016). Accurate studies of the specimens which arrived in Europe were showing the great anatomic proximity they had with humankind, further contributing to a progressive demise of the idea of human superiority and exclusivity in the natural world. From here on, the entire anthropocentric paradigm developed over the previous millennia would be increasingly challenged (Corbey 2005).

In the meanwhile, a different perception of these animals, based on their behavior in the wild and on the observations of important naturalists, left the old conception behind. Moreover, the museums of natural history and the zoos that had multiplied across Europe since the 18th century never failed to get the Barbary macaque's specimens in their collections, being one of the easiest primates to obtain. As the French naturalist Gervais (1854, p. 98) stated in the 19th century, "After the occupation of Algeria in France we received a large number of them." Their life in organized social groups begun to be described by the French botanist René Louiche Desfontaines, (1751–1833) who spent two years exploring Tunis and Algeria:

They live in the forest of Bugia, Stora and Cole [Ndr. Collo] . . . [ . . . ]. They live in large companies in the forest of the Mount Atlas, near the sea, and they are so common at Stora, that the neighborhood are sometimes covered with them [ . . . ]. They fed on pine-cones, soft nuts, Indian figs, melons, water melon, and on the vegetable the Arabs cultivate in their gardens. [ . . . ] While they commit their thefts two or three of them are stationed upon the tops of the highest trees and rocks as sentinels and as soon as they perceive any one, or hear a noise, they emit a sharp cry, and the whole troop immediately runs away, carrying with them everything they can seize. (Buffon 1766, pp. 30–31, translation from French *apud* Contreras Martínéz 2015, p. 443)

Étienne Geoffroy St. Hilaire (1772–1844), in his *Tableau des Quadrumanes* (Geoffroy Saint-Hilaire 1812) was able to distinguish the behavior of captive and wild Barbary macaques, noting their affliction when deprived of their fellows leading them to an almost vegetative state:

The natural sentiment which makes it to live in the society of its fellows, when in the enjoyment of liberty, induces it, in confinement to adopt such small animals as are given to it for companionship; it carries them everywhere about with it, embracing and hugging them most affectionately, and becoming furious at any attempt to take them from it. We are assured that these animals attend their young with a care and affection not to be surpassed by the tenderest mother, and that they bestow the greatest pains in keeping them clean and neat. (Geoffroy Saint-Hilaire 1812 *apud* Rennie 1838, p. 392)

The Barbary macaque's taxonomy and its exact geographical range was still debated throughout the 19th century, and went through several nomenclatural forms before arriving at today's name proposed by Thomas in 1911 (cf. Fooden 2007, pp. 28–30).

### 3. Recent and Contemporary Period

The story of our relationships with the Barbary macaque shows an endless exploitation and human pressure on this animal across historical periods. The large and continuous removal of specimens from their natural habitats undoubtedly had an impact on the natural selection of the wild populations and their reproductive capacity (despite this, the species showed a certain resilience at least until the end of the 19th century, see later). These facts associated to past and contemporary ecological issues, such as the progressive loss of prime habitat, mainly cedar and oak forests, but also to a long list of other threats such as persecution, predation by feral dogs, inappropriate artificial feeding by tourists and local inhabitants, and pollution of the rivers associated with forests, are leading the Barbary macaque to extinction. The millenary tradition in all the Mediterranean area to use these animals as pets continues to promote live trade (Bergin et al. 2017). Most of the specimens taken from the wild are for the international and national pet trade—being used for display, entertainment (as we have seen, a very ancient practice), or as household pets in local commercial use. Sanctuaries and zoos in Europe have become overstocked with Barbary macaque infants offered to them by authorities and ex-owners (Butynski et al. 2008). Overall, the population of this species is estimated to have declined at a rate exceeding 50% over the last three generations (24 years). Currently *M. sylvanus* is extinct in Tunisia and listed as endangered by the IUCN Red List 2018 (Butynski et al. 2008).

In the first decade of the past century (Joleaud 1931; McDermott 1938), drawing from ancient historical evidence resumed in this work, it was observed that the difference in the treatment of macaques in the different parts of the North African region (in Eastern part they were hunted, in the Western encompassing Morocco and Algeria, they were more protected) might have been the first historical turning point towards the complete disappearance of the Barbary macaque in Tunisia. The habit of hunting and eating monkeys in this area and surrounding regions (present day North-East Algeria and North Tunisia) seems to have remained as a form of sustenance and traditional feeding until the 19th century when the monkeys were still observed, although they had already become very rare (Joleaud 1931, p. 134). In the 18th century (1783–1786), both the already mentioned French botanist Desfontaines and Poiret (1789) claimed that these animals were very common in Stora, in Collo and Bejala. Interestingly, in 1848, the French naturalist Gervais (Gervais, 1848; Gervais 1854, p. 98) noted that monkeys had become rare in Stora but people were hunting them in the surrounding areas to bring them to Philippeville (today Skikda, Algeria) where Arabs appreciated very much their meat, although it is considered *haram* (impure) by the Koran.

The Joleaud's and McDermott's thought may have a foundation, but it should be noted that even in other parts of Algeria, the capture of monkeys was huge—probably already in Roman times and particularly in the modern period. The Islamic influence may have brought some components, further contributing to regard monkeys in a negative way also in those territories where, before, the macaques were respected. In such territories, especially in the mountainous areas, Berber traditional populations lived in close contact with these animals who had a relevant role in their cultural beliefs. Local oral traditions reported by Joleaud in the 1930s, show how the Barbary macaque was considered a race of human beings fallen into disgrace and thus transformed into monkeys. A legend of the Kabyle ethnic group told that:

Two young shepherds, lost in an uninhabited quarter of Djurdjura and hungry, pleaded with such fervor God's help, that He sent them a plate of couscous. But after having been satisfied with this divine dish and probably with minds obscured by the alcoholic nectar which accompanied the food, the two incautious decided to use the container that contained the couscous for a such use that the suddenly ruthless providence changed them into monkeys. (translated from Joleaud 1931, p. 125)

The Kabyle's cosmogony, which probably precedes the monotheistic religions (cf. [Abrous and Chaker 2004](#)) tells that the First Mother of the World, the deity who gave origin to all things, used different methods to create animals. For example, some animals were shaped by her with wheat flour, while others derived from the metamorphosis dictated by the rage of the First Mother of the World; this is the case of a young boy transformed into a monkey. The bond between people and the Barbary macaque still appears alive in the contemporary Kabyle folk tradition: monkeys are associated to mountains and caves but also regarded as intelligent and kind animals willing to help travelers in need by providing them with food (e.g., the legend of *La Grotte des Singes* among others, see [Kabylie Djurdjura](#)).

Berbers of Algeria and Morocco had a multiplicity of names to refer to the Barbary Macaque (cf. [Joleaud 1931](#), p. 119) but they preferred Islamic names in order to not pronounce directly their names, because that could be a taboo to avoid bad omens. Periphrasis may also be used to define these monkeys: such as "lovers of almonds" or other ones which testify the attitude toward these animals considered part of our "species" or our predecessor: "they who live in the mountains", or "the children of the forest." Likewise, it is curious that, in the north of Morocco, a fraction of Ghomara ethnic group, was called Beni Ouktha, which means "the children of the monkey" ([Joleaud 1931](#), p. 124). A popular tradition widespread in northern Morocco wanted that there existed "a city of monkeys" (localized in the Rif mountain, near Ketama) where the animals of this city "who lived and governed themselves like men", were very feared by people of the Maghreb. Here and there, folklore evoked the persistent memory of populations, having had the Barbary macaque for totem, at least until the first half of the past century.

In the past, crop-raids of monkeys, although very serious, did not produce a great persecution. Many peasants used stratagems such as putting a rattle on the neck of a monkey captured after one of their crop-raids, thus when he tried to reconnect with the social group, the others would flee frightened and away from the cultivated fields. Currently, the situation is very different. Even in the places where monkeys have traditionally been respected, we witness a great decline of the Barbary macaque populations. Conflicts with local people have been reported in Algeria and Morocco as a result of crop-raids by macaques ([Alexander 2018](#)). The reduction, degradation and fragmentation of macaques' natural habitats are probably key factors that influence the escalation of conflicts, as happened in many other African areas (e.g., [Lamarque, François, Jennifer Anderson, Rosalie Fergusson, Marie Lagrange, Yaw Osei-Owusu, and L](#)). Moreover, many ecological studies appoint that the great reduction of Barbary macaque populations is mainly due to the not sustainable anthropic land use and that their actual distribution is justified not because of their habitat preference or selection ([Fa 1983](#)), but because they "remain in zones which humans have been unable to use or reach" ([Ménard and Vallet 1997](#), p. 284) or where they can find food (see the case of Atlas monkeys fed by tourists, ([Waterman et al. 2019](#))). This is in accordance with the fact that this monkey is a generalist and a very adaptable and eclectic animal.

Recent studies (e.g., [Davis 2006](#), p. 2007) report that the French colonial activity from 1880 to 1930 was responsible for a great deforestation in North Africa. "Forest which had provided pastures, food, medicinal plants, place to live, and agricultural plots were demarcated rationalized and improved to provide timber cork and other products for the European market" ([Davis 2006](#), p. 93). Traditional pastures, which allowed local herders to subsist, were converted in modern sheep-raising; local agricultural production was modernized and it required land. This model was also followed by the more recent neoliberal activities of the Algerian and Moroccan governments ([Davis 2006](#), p. 94; [Cutler 2018](#)). Both the French colonial and the more contemporary narratives indicated the cause of land degradation on overgrazing by local pastoralists and other traditional activities, despite existing documentation that suggests instead that ploughing of marginal lands and over-irrigation are the primary drivers of land degradation in the region ([Davis 2007](#)). On the contrary, such traditional livelihood activities are now understood to be appropriate in this kind of environment. According to the work *A History of Algeria* (2017) by James McDougall (*apud* [Cutler 2018](#)), "The agricultural system of Algeria, the 'optimal ecology', includes people, their plantings and harvestings, and their animals interacting with the mountains, streams, and climate."

Since the 19th century, Berbers and other traditional ethnicities who had lived for millennia in these fragile ecosystems have been marginalized, their communities fragmented and their territories expropriated. Berber cultural life also suffered a long-term discrimination with official 'Arabization' campaigns (Ferhat 1981; Brugnattelli 2006). Barbary macaques' populations followed the progressive disappearance of their natural habitats and, in some way, the fate of Berbers. For instance, already in the first years of the 20th century, this species had decreased a lot in the Chiffa and Palestro gorges after the construction of the railway between Algiers and Constantine (Joleaud 1931, p. 137). Unfortunately, the conservation measures adopted in the last decades such as restricting access of grazing animals, zonation with fencing, education on sustainable use of the forest and so on, have not yet mitigated threats to the Barbary macaque (cf. Camperio-Ciani et al. 2005; Bderrazak et al. 2013).

The special relationship between the Berber populations of Algeria and Morocco and Barbary macaques, which seems to have somehow protected these animals in the past, can perhaps be used today to prevent the disappearance of this emblematic animal. A recent work of Waters et al. (2018a) showed that many shepherds in Northern Morocco have a very complex ontology of Barbary macaques, not completely explainable if we just consider the Islamic religion influence typical of these areas. These and other rural populations can show a sort of cultural resilience transmitted by popular tradition that attributed a totemic value to this animal, as seems the case of High Atlas dwellers. Therefore, it would be relevant, for future Barbary macaque conservation plans, to consider the religious syncretism, and the elements of animism that still exist in these populations. The traditional Berber perception, which saw macaques as human kin can be used in favor of macaques' conservation in order to develop a greater respect, even when other religions are present. A different perception might come to reduce the use of macaques for entertainment and poaching of young macaques for illegal trade.

Animal conservation is currently regarded as a wicked problem because the interconnection between environment, policy, economy and peoples is often inextricable and there are numerous interacting elements lacking any central control (Game et al. 2014). This is the case of *M. sylvanus* whose future depends on the resolution of many socio-ecological and socio-economic factors. These range from the establishment of new protected areas and halting the clear-cutting of forests, but also from a more sustainable and less predatory use of the fragile territory of North Africa in order to allow rural populations to continue their traditional activities not in conflict with monkeys but alongside them, as it has been for a long time.

#### 4. Concluding Remarks

The complex human–Barbary macaque relationship was shaped by a millenary history of interactions, physical and cultural intertwining between this animal and the native and hexogen Mediterranean civilizations. Across centuries, this fact likely impacted the behavior, ecology and sociality of the Barbary macaque but also affected human primate conceptualization producing new cultures and approaches to the natural world.

Being the unique primate species endemic to Mediterranean shores, it was described since antiquity, filling these places with its boisterous presence and being part of the daily life of the peoples of North Africa where it was regarded as a sacred and totemic animal for probably a long time. Its presence was remarkable in the Western cultural and social landscapes since the 1st millennium BCE and throughout the classical period. In the Greco-Roman world, this animal assumed different roles and cultural meanings, having many conceptual attributes, but above all, being regarded as the prototype of the 'monkey'. The identity of animals is often used to create a specific idea about human identity thorough comparison and contrasts, and this tailless animal actively took part in the definition of humanity's boundaries. This species counted a great array of symbolical meanings having a very important part in the evolution of Western thought. It appears that more than any other primate also known since antiquity in Europe (baboons and green monkeys), and before the discovery of the great apes by Europeans in the Modern period, the Barbary macaque embodied the crucial discussion about our place in nature. It was the intermediate links among us and the other animals,



the metaphor of the ‘otherness’ together with freak and other hybrid creatures. After losing its sacred and totemic value, its intermediate nature and above all, the lack of the tail gave it the honor and burden of symbolizing the human caricature, human’s vices and worst sides, being repudiated even by the gods. As reported by Calder (2018, p. 77), “The imperfect similarity of primates to humans, in behavior and appearance, allowed Greeks to laugh at the worst in humanity, safely dissociated from themselves.” This animal, ridiculous by nature, offered “even to the most degraded of men a feeling of superiority” (McDermott 1938, p. 109). The Barbary macaque was also used for centuries as the “basis of human anatomy”: for more than a millennium, before the 16th century, Vesalio’s anatomical studies and “humans actually knew more about the internal anatomy of this species than about that of their own bodies” (Diogo 2018).

Entering the Middle Ages, the ugly ‘monkey concept’ became representative of devil and then of the sinner, degrading humanity corrupted by him. This resulted in their use in racist stereotyping of different ethnicities or minority groups, a widespread practice in medieval Europe that has continued to the present day. Yet, this animal continued to be the most appreciated by upper classes and street performers in the Middle Ages and Modern period, taking part of the daily life of people in every part of Europe. During the Modern Period, this heavy legacy of the past was weakening also thanks to the flow of evidence in Europe regarding their behavior in nature, accompanied by a more precise scientific description; nevertheless, the capture of wild specimens did not decrease. They were used as entertainment animals, in and out of their lands of origin, and were exhibited in zoos and museums. Moreover, they likely remained as a form of local sustenance in North Tunisia until the 19th century, where they were still observed. Overall, the removal of these animals from their natural habitats appears to have continued incessantly for circa two millennia.

It is hard to understand all the ecological consequences which arise from this bond between humans and the Barbary macaque. This animal is one of the most important seed dispersers of cedar forests, and the continued depletion of their populations over the centuries may have contributed to an impoverishment and reduction of these habitats. More studies are necessary to understand the effects that continuous removals have had over the centuries on the vitality and resilience of wild populations. Nevertheless, the great decline of this species occurred in the last century and appears correlated with the massive loss of natural habitats associated to the French colonial occupation and to the more recent neoliberal activities of the Algerian and Moroccan governments. In recent years, many studies have been made, which have integrated cultural perception and interaction with biological data, especially considering the worrying situation that increasingly places these animals in conflict with the local and traditional populations (Alexander 2018; Waters et al. 2018a, 2018b). Thus, it makes sense, using the traditional local beliefs, which saw macaques as human kin, in order to develop a greater respect to these animals, helping their conservation.

Historical data, although full of bias regarding places and historical periods, can provide us with important information for a better understanding of the past and current human/primate interface.

**Funding:** This research was funded by Portuguese national funds through FCT—Fundação para a Ciência e a Tecnologia in the context of the celebration of the program contract foreseen in n° 4,5,6, of art. 23 of D.L. n° 57/2016 and 57/2017.

**Acknowledgments:** I am very grateful to Simona Grazzini for her help and friendship during the visit at the macaques of Gibraltar and to Marco Masseti for his teachings and the always precious discussions. I also thank the anonymous reviewers of the paper for their comments and suggestions.

**Conflicts of Interest:** The author declares no conflict of interest.

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