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Ancient and Medieval Animals and Self-recognition: Observations from Early European Sources

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Abstract

This article presents the oldest European accounts that describe the reactions of animals to their own reflections on the surface of a body of water or in a mirror. The analysed sources will encompass Greco-Roman accounts, including the reception of these accounts in the Middle Ages. While this article belongs to the field of the history of science, it seeks to provide a historical commentary with insights from contemporary studies (the mirror test, MSR). The article presents surviving ancient and medieval accounts about particular animal species that describe their ability or inability to recognise a mirror reflection. The species discussed are the horse, mule, dog, birds (sparrow, partridge, rooster, quail, jackdaw, starling and pheasant), the monkey and tiger. Brief mention is also made of the sheep, pigeon, goose, parrot, raven and cat.

Keywords

ancient and medieval animals – mirror test – self-recognition

Introduction

The mirror test is a method that allows for a scientific evaluation of the presence of self-awareness in animals. Developed by Gordon G. Gallup, it involves

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an analysis of the behaviour of an animal standing in front of a mirror, after a mark has been placed on a part of its body that the animal can see only in the mirror – in the same way a human observer cannot look directly at their own ear, for example, but only as reflected in a mirror. An interest in the mark indicates that the animal has an ability to recognise itself in the mirror and does not regard its reflection as belonging to a different creature. Since the 1970s, the test has been conducted on a progressively higher number of animals, with some primate species (all anthropoid apes: chimpanzees, bonobos, orangutans and some gorillas), dolphins, killer whales, elephants and magpies demonstrating self-recognition.¹ Although the mirror test has been criticised for several reasons, it remains one of the most important experimental tools in comparative psychology.² The first observation of self-recognition in history

- 1 Chimpanzee (*Pan troglodytes*); bonobo (*Pan paniscus*), orangutan (*Pongo pygmaeus*); gorilla (*Gorilla gorilla*); bottlenose dolphin (*Tursiops truncatus*), orca (*Orcinus orca*); Asiatic elephant (*Elephas maximus*); magpie (*Pica pica*); see Gordon G. Gallup, Jr., "Chimpanzees: Self-recognition," *Science*, 167 (1970), 86-87; Suzanne Robert, "Ontogeny of Mirror Behavior in Two Species of Great Apes," *American Journal of Primatology* 10, (1986): 109-117; Suzanne Calhoun, Robert L. Thompson, "Long-term Retention of Self-Recognition by Chimpanzees," *American Journal of Primatology*, 15 (1988), 361-365; Gregory C. Westergaard and Charles W. Hyatt, "The Responses of Bonobos (*Pan paniscus*) to their Mirror Images: Evidence of Self-recognition," *Human Evolution*, 9 (1994), 273-279; Kenneth Marten and Suchi Psarakos, "Evidence of Self-Awareness in the Bottlenose Dolphin (*Tursiops truncatus*)," in Sue Taylor Parker, Robert Mitchell and Maria Boccia, eds., *Self-awareness in Animals and Humans: Developmental Perspectives* (Cambridge, 1995), 361-379; Vera Walraven, Linda van Elsacker and Rudolf Verheyen, "Reactions of a Group of Pygmy Chimpanzees (*Pan paniscus*) to their Mirror-images: Evidence of Self-recognition," *Primates*, 36 (1995), 145-150; Diana Reiss and Lori Marino, "Mirror Self-recognition in the Bottlenose Dolphin: a Case of Cognitive Convergence," *Proceedings of the National Academy of Sciences of the United States of America*, 98 (2001), 5937-5942; Fabienne Delfour and Ken Marten, "Mirror Image Processing in Three Marine Mammal Species: Killer Whales (*Orcinus orca*), False Killer Whales (*Pseudorca crassidens*) and California Sea Lions (*Zalophus californianus*)," *Behavioural Processes*, 53 (2001), 181-190; Gordon G. Gallup Jr., James R. Anderson and Daniel J. Shillito, "The Mirror Test," in Marc Bekoff, Colin Allen and Gordon M. Burghardt, eds., *The Cognitive Animal. Empirical and Theoretical Perspectives on Animal Cognition* (Cambridge, MA, 2002), 325-334; Jason Miller, "Minding the Animals: Ethology and the Obsolescence of Left Humanism," *American Chronicle*, May 17 (2009); Monique de Veer, Gordon G. Gallup Jr., Laura A. Theall, Ruud van den Bos and Daniel J. Povinelli, "An 8-year Longitudinal Study of Mirror Self-recognition in Chimpanzees (*Pan troglodytes*)," *Neuropsychologia*, 41 (2003), 229-334; Joshua M. Plotnik, Frans B.M. de Waal and Diana Reiss, "Self-recognition in an Asian Elephant," *Proceedings of the National Academy of Science*, 103 (2006), 17053-17057; Sandra Posada and Montserrat Colell, "Another Gorilla (*Gorilla gorilla gorilla*) Recognizes Himself in a Mirror," *American Journal of Primatology*, 69 (2007), 576-58; Helmut Prior, Ariane Schwarz and Onur Güntürkün, "Mirror-induced Behavior in the Magpie (*Pica pica*): Evidence of Self-recognition," *PLoS Biol*, 6(8) (2008), 1642-1650.
- 2 See, for example, Philippe Rochat and Dan Zahavi, "The Uncanny Mirror: A Re-Framing of Mirror Self-Experience," *Consciousness and Cognition*, 20 (2011), 204-213; Colin Allen, Michael

was reportedly made by Charles Darwin during a visit to a London zoo in 1838, when he gave an orangutan a mirror to play with.³

The question arises of whether there were earlier observations of animals looking at their reflections in a mirror or on the surface of water. It seems that traces of such observations go back as far as Antiquity, when knowledge of the inability of certain animals to recognise their own reflections was used for practical purposes; for example, for hunting birds. Accounts also suggest that the Greeks and Romans sometimes attributed self-awareness to animals. Characteristically, some of these assumptions were adopted and strengthened in the Middle Ages, when people were inclined to attribute to animals self-awareness and the ability to recognise their own bodies in a mirror.

The aim of this article is to present the oldest European accounts that describe the reactions of animals to their own reflections. The sources analysed will encompass Greco-Roman accounts, including the reception of these accounts in the Middle Ages. While this article belongs to the field of the history of science, it seeks also to provide a historical commentary with insights from contemporary studies. The authors find several interesting descriptions of animal self-recognition in ancient and medieval sources.

The first part of the article presents the modern discussions on animal self-awareness, and an assessment of some accounts of ancient and medieval concepts about animals (including the oldest European observations). The second part of the article includes a brief description of the ancient concept of the human being as a 'rational animal', and the surviving accounts (starting from the oldest preserved sources) of particular animal species are presented, which describe their ability or inability to recognise a mirror reflection. The species discussed are the horse, mule, dog, birds (sparrow, partridge, rooster, quail, jackdaw, starling and pheasant), monkey and tiger. Brief mention is also made of the sheep, pigeon, goose, parrot, raven and cat.

Trestman, "Animal Consciousness," in Susan Schneider and Max Velmans, eds., *The Blackwell Companion to Consciousness. Second Edition* (Chichester, 2017), 63-76.

3 See John van Wyhe and Peter C. Kjaergaard, "Going the Whole Orang: Darwin, Wallace and the Natural History of Orangutans," *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, 51 (2015), 53-63; Mark Pendergrast, "Mirror, Mirror: A Historical and Psychological Overview," in Miranda Anderson, ed. *The Book of the Mirror: An Interdisciplinary Collection Exploring the Cultural History of the Mirror* (Cambridge, 2007), 1-14.

1 The Animal in the Mirror: Modern Controversies

As Frans de Waal rightly observes:

The problem with the mirror test was that it introduced the wrong absolute difference. Instead of sharply dividing humans from all other animals [...] Gallup's mirror test moved the Rubicon slightly to annex a few more species. Lumping humans in with the apes so as to elevate the Hominoids, as a group, to a different mental level than the rest of the animal kingdom, didn't go over well. It diluted humanity's special status. Still today, claims about self-awareness outside our own species cause consternation, and debates about mirror responses turn acrimonious. Moreover, many specialists have felt the need to conduct mirror tests on the animals in their care, usually with disappointing results. These debates have led me to the sarcastic conclusion that mirror self-recognition is considered a big deal only by scientists working on the handful of species capable of it, whereas all others poo-poo the phenomenon.⁴

Are animals aware of the world but not of themselves? Human babies start to recognise themselves in a mirror at about 15-18 months.⁵ Many animals are fascinated by mirrors but do not seem to realise that what they are seeing is their own reflection. The ability to recognise oneself in a mirror is a rare capacity in the animal kingdom. A wide range of species have been reported to fail the mirror test. When most animals first see their reflection in a mirror they treat it as though it were another member of their own species. If a mirror is placed in the animal's territory, it may attack the image, assuming it to be an intruder. 'Image fighting' is the term used to describe attacks made by a bird against its reflection in a house window or a car mirror.⁶ Fish also try to fight themselves when they look into a mirror (a male responds to the image as it would to a competing male). Similarly, crows will aggressively attack their image in the mirror as if it were a novel, same-sex conspecific.⁷ Some cats initially see their reflection as a potential playmate, while others ignore it. The

4 Frans de Waal, *Are We Smart Enough to Know How Smart Animals Are?* (New York-London, 2016), 241.

5 Michael Lewis, Margaret Wolan Sullivan, Catherine Stanger and Maya Weiss, "Self Development and Self-Conscious Emotions," *Child Development*, 60 (1989), 146-156.

6 Bruce Campbell and Elizabeth Lack, eds., *A Dictionary of Birds* (London, 1985), s.v. "Image fighting," 302.

7 Taichi Kusayama, Hans-Joachim Bischoff and Shigeru Watanabe, "Responses to Mirror Image Stimulation in Jungle Crows (*Corvus macrorhynchos*)," *Animal Cognition*, 3 (2000), 61-64.

reactions of dogs also vary, with responses that include: barking, jumping, trying to play with the dog in the mirror, as well as attempts to look behind the mirror to find the other dog. Many other examples could be included. In summary, when an animal first sees its image in a mirror, it may attack the image, most display fear or they direct social behaviours towards the image.

The fact that many animals fail the mirror test is a controversial issue among some researchers because it is entirely focused on vision. Some animals do not show ‘visual self-awareness’ because their visual perception is different from that of humans. These animals may express self-awareness through other senses; for example, through smell.⁸ Marcus du Sautoy makes the interesting observation:

Of course, the mirror self-recognition test is a very crude measure of consciousness. It has a bias toward species with highly developed sight [...] Even for those species for whom sight is the primary sense with which to negotiate the world, it is a very rough test of self-awareness. Nonetheless, it has striking consequences when applied to humans, because we can use it to discover when the brain goes through a transition that allows us to start to recognize the image in the mirror.⁹

Despite such criticism, the mirror test remains the most popular test for determining self-awareness. As Noah Strycker briefly states: “[...] there does seem to be a worldly divide between those who can and can’t recognize their own reflection.”¹⁰

2 Sources of Knowledge about Ancient and Medieval Animals

Despite the unsuccessful attempts in Antiquity to establish a separate discipline (*technē*) dedicated only to the study of fauna, we know that a great number of works about animals were written at the time; the majority of them have been lost, however.

8 See, for example, the “sniff test for self-recognition” proposed by Robert Cazzolla Gatti, “Self-consciousness: Beyond the Looking-glass and What Dogs Found There,” *Ethology, Ecology and Evolution*, 28 (2016), 232-240.

9 Marcus du Sautoy, *The Great Unknown. Seven Journeys to the Frontiers of Science* (New York, 2016), 318.

10 Noah Strycker, *The Thing with Feathers. The Surprising Lives of Birds and What They Reveal about Being Human* (New York, 2014), 220.

For a person living in Antiquity, the word *zōon*, which is translated as ‘animal’, denoted every living creature, including humans, as classified by Aristotle, ‘the father of zoology.’¹¹ Humans were distinguished by other categories including the *logos*, *mnēmē*, *nous* and *psychē* – consequently, an animal would immediately be brought to mind by the word *zōon*.

Because the studies of animals were not limited to one discipline at that time, the interest in animals was widespread and common. Detailed information about the appearances and habits of animals was given in literary works of virtually every possible genre; furthermore, it should be noted that the poetical accounts were not treated *a priori* as sources less credible than natural studies. Strabo called Homer the founder of geography (*archēgetēs*), which was a science that included animals.¹² On the other hand, one of the guests in the *Deipnosophists* by Athenaeus called Aristotle’s natural studies “the nonsensical speculations of a druggist (*pharmakopōlēs*),” and questioned the sources he had used. He asked, for example, how Aristotle could know the average lifespan of a fly, and how he had observed that a certain fly lived to the age of six or seven years.¹³ As Richard Buxton astutely points out, “Aristotelian zoology represents a marked contrast to the mythical tradition. But the distinction between folklore and zoology is not rigid: we find excellent zoology in anecdote, and mythological patterns and concerns in zoology.”¹⁴

In the Middle Ages, the descriptions of real and fantastical animals were found in chronicles, treatises, bestiaries and encyclopaedias which, as works propagating knowledge, were dedicated to the clergy and laypersons without access to university education. The authors presented the collected material according to particular concepts, by selecting pertinent issues addressed in the works of acknowledged authorities.¹⁵ Animals were an element of theophanic harmony, as the philosophers saw God’s influence in each animal due to its form, shape or behaviour.

11 See, for example: Geoffrey E.R. Lloyd, “The Development of Aristotle’s Theory of the Classification of Animals,” *Phronesis*, 6 (1961), 59–81; Pierre Pellegrin, *Aristotle’s Classification of Animals* (Berkeley-Los Angeles, 1986); Arnaud Zucker, *Aristote et les classifications zoologiques* (Louvain, 2005).

12 Strabo, *Geographica* 1.1.1; 1.1.16, ed. Horace Leonard Jones, 8 vols. (London and Cambridge, MA, 1917–1932).

13 Athenaeus, *Deipnosophistae* 352b–354b, ed. Charles Burton Gulick, 7 vols. (London-Cambridge, MA, 1927–1941).

14 Richard Buxton, “Wolves and Werewolves in Greek Thought,” in Jan Bremmer, ed., *Interpretation of Greek Mythology* (New York, 1987), 67.

15 Gregory G. Guzman, “Encyclopedias,” in Frank A.C. Mantello and Arthur G. Rigg, eds., *Medieval Latin. An Introduction and Bibliographical Guide* (Washington D.C., 1996), 702–707.

3 The Value of Ancient and Medieval Observations

Tales from far away that were passed on by word of mouth and direct observations together constituted the basis of the knowledge about animals in Antiquity. Of course, the Greeks and Romans made many ludicrous mistakes concerning animals, even the ones native to their regions. If we can believe Aristotle, Alcmaeon of Croton thought that goats breathed through their ears.¹⁶ Nevertheless, the experiences of the people who could be called experts, since they specialised in observing and studying animals on an everyday basis, were commonly used. These experts certainly included farmers, gardeners, breeders, bee-keepers, hunters, fishermen and merchants.¹⁷ Knowledge about exotic animals was acquired from travelling ‘veterinaries’ and other travellers, as well as from menageries and the Alexandrian zoo. Mock hunts, fights and shows involving trained animals were organised in amphitheatres. It should be added that the Greeks and Romans domesticated a large number of species.¹⁸

In Antiquity, many observations were made for the first time about animal psychology and behaviours, such as homosexual behaviour (e.g., Aristotle studied temple roosters that mated with each newly-arrived bird¹⁹), ritual behaviours resembling religious rites (e.g., elephants and monkeys that ‘worshipped’ celestial bodies²⁰), the imitative behaviours of birds (e.g., magpies and parrots that imitated human speech, and dancing scops owls (*Otus*) that tried to match a musical rhythm²¹) and attempts at problem solving (e.g., ravens that threw pebbles into water in order to raise its level, making it acces-

16 Aristotle, *Historia animalium* 492a, eds. Arthur L. Peck and David M. Balme, 3 vols. (London-Cambridge, MA, 1965-1991).

17 See Liliane Bodson, “Some of Aristotle’s Writings about Bird Behavior and Issues Still Current in Comparative Psychology,” *International Journal of Comparative Psychology*, 9 (1996), 26-41; Liliane Bodson, “Zoological Knowledge in Ancient Greece and Rome,” in Gordon Lindsay Campbell, ed. *The Oxford Handbook of Animals in Classical Thought and Life* (Oxford, 2014), 556-578.

18 See Francis D. Lazenby, “Greek and Roman Household Pets,” *Classical Journal*, 4 (1949), 245-252, 299-307; Kenneth F. Kitchell Jr., “Penelope’s Geese. Pets of the Ancient Greeks,” *Expedition*, 53 (2011), 14-23; Ann Ashmead, “Greek Cats,” *Expedition*, 20 (1978), 38-47.

19 Aristotle, *Historia animalium* 614a.

20 For example: Pliny, *Historia naturalis* 8.1, eds. Harris Rackham, William H.S. Jones and David E. Eichholz, 10 vols. (London-Cambridge, MA, 1938-1963); Cassius Dio, *Historia Romana* 39.38.5, ed. Earnest Cary, 9 vols. (London-Cambridge, MA, 1914-1927); Aelianus, *De natura animalium* 4.10, ed. Alan F. Scholfield, 3 vols. (London-Cambridge, MA, 1958-1959); Solinus, *Collectanea rerum memorabilium* 111, ed. Theodor Mommsen (Berlin, 1895).

21 For example: Aristotle, *Historia animalium* 597b; Pliny, *Historia naturalis* 10.59; Plutarch, *De sollertia animalium* 3, eds. Harold Cherniss and Wiliam C. Helmbold, *Moralia*, vol. 12 (London-Cambridge, MA, 1957).

sible for drinking).²² These observations are a subject of keen interest for today's researchers.

The scientific value of these ancient observations is proved by the fact that they often agree with contemporary observations (although of course, ancient sources also contain many irrelevant theories). The ancients believed that the elephant had an extraordinary intelligence (*intellectus*), and some authors even thought that the elephant was second only to humans in terms of its intellect.²³ A huge number of tales have also been preserved about exceptionally clever dolphins, whose attitude towards humans was the friendliest of all animals.²⁴ The extraordinary acuity of apes and monkeys, including the ability to learn the letters was also described.²⁵ However, these talents were believed to result only from mimetic abilities.²⁶

A large number of these observations can be found in medieval descriptions. Their authors copied fragments of works by the ancient authorities, mainly Aristotle, Pliny and Solinus, while adding an allegoric-symbolic interpretation in accordance with the Christian understanding of nature. As with those in Antiquity, the observations in the Middle Ages were collected during hunts and through everyday work on farms. Domestic animals were also observed.²⁷

4 Humans as 'Rational Animals'

The human, as 'rational animal,' was one creature in Antiquity whose ability to recognise itself in a mirror was taken as self-evident (see fig. 1). A wise person could not only recognise but also improve himself using a mirror. As Diogenes Laertius wrote, Socrates "recommended to the young the constant use of the mirror, to the end that handsome men might acquire a corresponding behav-

22 For example: Pliny, *Historia naturalis* 10.60; Plutarch, *De sollertia animalium* 10; Aelianus, *De natura animalium* 2.48.

23 For example: Pliny, *Historia naturalis* 8.1; Plutarch, *De sollertia animalium* 12; Philostratus, *Vita Apollonii* 2.14.2, ed. Frederick C. Conybeare, 2 vols. (London-Cambridge, MA, 1912).

24 See Kenneth F. Kitchell, Jr., *Animals in the Ancient World. From A to Z* (London-New York, 2014), 53-57, s.v. "dolphin."

25 For example: Strabo, *Geographica* 15.129; Aelianus, *De natura animalium* 6.10.

26 See William Corfman McDermott, "The Ape in Greek Literature," *Transaction of the American Philological Association*, 66 (1935), 165-176; idem, "The Ape in Roman Literature," *Transaction of the American Philological Association*, 67 (1936), 148-167; idem, *Ape in Antiquity* (Baltimore, MD, 1938).

27 Kathleen Walker-Meikle, *Medieval Pets* (Woodbridge, 2012).



FIGURE 1

A woman looking at her reflection in a mirror. Attic red-figure alabastron, c. 500 BC, Athens, Piraeus Museum: inv. 6255. From Michael Squire, "Introductory Reflections. Making Sense of Ancient Sight," in Michael Squire, ed., *Sight and the Ancient Senses* (London-New York, 2016), 6.

our, and ugly men conceal their defects by education."²⁸ The inability to recognise one's own reflection in a mirror was treated as a manifestation of deep naivety, or stupidity. In his comment about the behaviour of Narcissus, Pausanias stated that it was absurd that someone old enough to fall in love could not differentiate between another person and their own reflection in a mirror.²⁹ Similarly, Philostratus stated that Narcissus had only to move or to make a different face to avoid his misfortune.³⁰ According to the *Suda*, the term *akkō* denotes a stupid woman, or one that sees a different person in the mirror and starts a conversation with her.³¹ Such behaviour provoked laughter, as is proven by the fact that Hermippus, a comedy writer, included such an episode in his work.³²

28 Diogenes Laertius, *De vita et moribus philosophorum* 2.5.33, ed. Robert Drew Hicks, 2 vols. (London-Cambridge, MA, 1925).

29 Pausanias, *Graeciae Descriptio* 9.31.7, eds. William Henry Samuel Jones, Henry Arderne Ormerod and Richard Ernest Wycherley, 5 vols. (London-Cambridge, MA, 1918-1935).

30 Philostratus, *Imagines* 1.23, ed. Arthur Fairbanks (London-Cambridge, MA, 1931).

31 *Suda*, *Lexicon s.v.* "akkō", online ed. and trans. David Whitehead, William Hutton, Catherine P. Roth, Patrick Rourke and Elizabeth Vandiver, contrib. by Ada Adler, Raphael A. Finkel and Ross Scaife (stoa.org).

32 Olympiodorus, *In Gorgias* 497a: 31.10, ed. Leendert G. Westerink (Leipzig, 1970).

A false, illusory image of the viewed object is described as a property of mirrors that could attract and mislead people. An attempt was made in the Middle Ages to eliminate the practical and self-reflexive function of the mirror. Philosophers, theologians and artists saw in the mirror either an idealised vision or a negative projection – God’s reflection or a tool of the devil. Therefore, mirror gazing could be seen as a misleading way of getting to know oneself and searching for spiritual beauty. The human mind, if it did not yield to the illusory image and the reflected falsehoods of the material world, would be able to receive God’s light and reflect His wisdom. The microcosm and the macrocosm reflected God’s wisdom, a wisdom with which His creations were imbued.³³

5 The Horse: *hippos/equus*

Unsurprisingly, the oldest observations of self-recognition concerned horses, given that they were the animals to which the Greeks gave their utmost care.³⁴ The oldest preserved source on the subject is a fragment from Sophocles’ play entitled *Tyro*, staged at the end of the fifth century BC. In this play, a young woman cries over her cut hair, while comparing herself to a mare led to a watering place by the stream, where the animal sees its reflection (*eidōlon skias*) and feels embarrassed because it sees its cut mane.³⁵ More than a half century later, Aristotle wrote in *Historia animalium* that when mares have their manes cut, their sexual drive decreases, and the mares themselves will look depressed.³⁶ Xenophon provides another piece of information, revealing that the mares’ manes were cut by mule breeders as it was considered unbecoming for a long maned mare to mate with a donkey.³⁷ The custom of disfiguring mares for breeding purposes is also confirmed by Pliny the Elder in *Historia naturalis*, and later on is mentioned three times by Aelian in *De natura animalium*.³⁸ Plutarch (and later Pollux) clearly stated that the mares, after having their beautiful manes cut by the breeders, were led to a river or lake so that they could see their reflections in the water and realise their own ugliness:

33 Herbert Grabes, *Speculum Mirror and Looking Glass* (Tübingen, 1973), 240; François Garnier, *Le Langage de l’image au Moyen Age*, vol. 2 (Paris, 1989), 223.

34 For example: Mark Griffith, “Horsepower and Donkeywork: Equids and the Ancient Greek Imagination,” part I, *Classical Philology*, 101 (2006), 185–246.

35 Sophocles, *Tyro* F 659, *Fragments* ed. Hugh Lloyd-Jones, 2 vols. (London-Cambridge, MA, 1996); Aelianus, *De natura animalium* 11.18.

36 Aristotle, *Historia animalium* 572b.

37 Xenophon, *De re equestri* 5.8, *Scripta Minora*, eds. Edgar C. Marchant and Glen W. Bowersock (London-Cambridge, MA, 1925).

38 Pliny, *Historia naturalis* 8.42; Aelianus, *De natura animalium* 2.10; 11.18; 12.16.

The man who cramps and diminishes his wife [...] is like those who shear their mares and then lead them to a river or a pool: when the poor beast sees how ugly she looks in the reflection (*eikōn*), ugly and unsightly, they say that she abandons her haughty airs and allows asses to mount her.³⁹

The above-mentioned accounts, especially Plutarch's, perhaps indicate that, according to Greco-Roman beliefs, mares were able to recognise their own mirror reflections. However, if we compare these sources with Columella's account in *De re rustica* (first century AD), we will find that this conclusion is premature. The author of the most prominent agronomical treatise in Antiquity described an illness in a mare that he called 'madness' (*rabies*). He wrote that when the mares saw their reflection in the water (*in aqua imaginem suam viderint*), they would be overcome by amorous passion. Forgetting about food, they would then drive themselves to exhaustion from suffering and longing. The only cure for this illness was to cut their manes and lead them to the water, so that they could then see reflected their own ugliness. The mare would then forget the image that she was carrying in her memory (*Tum demum speculata deformitatem suam, pristinae imaginis abolet memoriam*).⁴⁰ Judging from the behaviour of the mare described by Columella which, as with Narcissus, does not recognise herself in the water, we are prevented from stating conclusively that the ancients considered mares as having the ability to recognise their own reflections.

The description of the remedy to the peculiar illness of mares provided by Columella was described also in a treatise about farming by the last great Roman agronomist, Palladius, written at the junction of the fourth and the fifth centuries AD.⁴¹ Because Palladius' work was popularly read in the Middle Ages (while Columella's treatise was rediscovered only at the beginning of the fifteenth century⁴²), the case of an insane mare looking at herself reflected on the surface of water gained popularity along with it. This belief survived into the Renaissance, as can be found in a work by Erasmus of Rotterdam, who states after Columella that mares will fall into madness when they see their

39 Plutarch, *Amatorius* 9, ed. W.C. Helmbold, *Moralia*, vol. 9 (London-Cambridge, MA, 1961); cf. Pollux, *Onomasticon* 1.217, ed. Erich Bethe, 3 vols. (Leipzig, 1900).

40 Columella, *De re rustica* 6.35, eds. E.S. Forster and Edward H. Heffner (London-Cambridge, MA, 1954).

41 Palladius, *Opus agriculturae* 14.27, ed. Robert Rodgers (Leipzig, 1975).

42 See Thomas Glick, Steven J. Livesey and Faith Wallis, eds., *Medieval Science, Technology, and Medicine: An Encyclopedia* (New York-London, 2005), 10-11, s.v. "Agronomy."

own reflection in the water.⁴³ Furthermore, various medieval encyclopaedias recommend cutting the mane of a mare to weaken her sexual drive and her pride, making her willing to mate with donkeys and thus conceive mules.⁴⁴

How stallions reacted to their reflections in the water is less clear. There are descriptions of a stallion falling in love with a statue or image (*agalmatophilia*), mistaking it for a living mare. For instance, a number of horses threw themselves at the statue of a mare in Olympia which, as the ancient authors try to explain, was endowed with a certain equine charm. However, it should be admitted that this story was questioned in Antiquity – Aelian did not want to believe that horses with their eyes open could succumb to passions for a bronze object.⁴⁵ On the other hand, because horses in Antiquity were sometimes seen neighing at the sight of beautiful paintings of horses, some of the ancients did not attribute to horses a highly developed self-awareness.⁴⁶ Aristotle remarked upon the fact that horses only drink muddy water, and when the water is too clear they will first churn it up with their hooves.⁴⁷ Interestingly, it was concluded in the Middle Ages that a horse would do this out of fear of its own reflection.⁴⁸

6 The Mule: *hēmionos, oreus/mulus, mula*

Another story about the ancient ‘mirror test’ concerns the offspring of a mare and a donkey – i.e., a mule (the Greek word for mule was *hēmionos*, meaning ‘half-ass’). Thales’ contemporary, Aesop (sixth century BC), tells a story of a mule that is happy that its mother is a mare, until it remembers that it was sired by a donkey.⁴⁹ Interestingly, in *Septem sapientium convivium*, Plutarch

43 Erasmus, *Parabola* LB 1 607A, ASD 1-5 264; *Collected Works of Erasmus. Literary and Educational Writings*, vol. 1, ed. Craig R. Thompson (Toronto-Buffalo-London, 1978), 240.

44 Vincentius Bellovacensis, *Speculum naturale*, l.18, c. 47-53, *Bibliotheca mundi [...] opera et studio Benedictinorum Collegii Vedastini in alma Academia Duacensi* (Douai, 1624; reprint Graz, 1964-1965); Brunetto Latini, *The Book of the Treasure*, c.186, eds. Paul Barette and Spurgeon Baldwin (New York-London, 1993).

45 Pausanias, *Graeciae Descriptio* 5.27.3-4; Aelianus, *De natura animalium* 14.18; Pliny, *Historia naturalis* 28.49.

46 Clemens Alexandrinus, *Protrepticus* 4.57.4, ed. G.W. Butterworth (London-Cambridge, MA, 1982); Valerius Maximus, *Facta et dicta memorabilia* 8.11.4, ed. D.R. Shackleton Bailey (London-Cambridge, MA, 2000).

47 Aristotle, *Historia animalium* 605a.

48 Ibn al-Awwām (a Spanish-Arab agriculturalist of the late twelfth century) interprets Aristotle’s statement: Ibn al-Awwām, *Kitāb al-filāha* 32.15, *Le Livre de l’agriculture*, trans. Jean-Jacques Clément-Mullet, vol. 11 (Paris, 1867), 64; see also: Charles Gladitz, *Horse Breeding in the Medieval World* (Dublin-Portland, OR, 1997), 185.

49 Aesop 315, *Aesopica*, ed. Ben Edwin Perry (Illinois, 1952).

modified Aesop's fable by adding that the mule became enraptured with itself when it saw its reflection in a river. Transfixed with the beauty of its own body and its grandness, it tossed its mane and started running like a steed, until the mule realised that it was also descended from a donkey.⁵⁰ This story could have been read in only a symbolic context, if not for the fact that Plutarch is considered the greatest animal 'psychologist' amongst the ancients.⁵¹ He was the first thinker in history who persistently searched for signs of humanity in animals.⁵² Moreover, he believed that a mare would recognise herself in a water reflection.

As a side note, we should also mention other hybrid animals. The author of a medieval bestiary describes the mule as the hybrid offspring of a mare and a donkey, and refers to the Book of Genesis, which mentions Jacob breeding striped, spotted and dappled sheep, by placing rods made from different trees at the watering place that were reflected in the water: "for his ewes conceived offspring like the images of the rams mounting them, which the ewes saw mirrored in the water <they were drinking>".⁵³ Continuing these considerations, the author of the bestiary gives an example of a ewe that saw the reflection in the water of a ram different from the one by which she was mounted; because the ram she saw was black, the ewe thought that she was producing offspring with a black ram, which was thereby believed to produce offspring of the same colour.

7 The Dog: *kyōn/canis*

Aesop would probably have been counted among the first philosophers had it not been for his background as a slave.⁵⁴ From him we have a wonderfully vivid description of a dog which, when crossing a stream with a piece of meat in

50 Plutarch, *Septem sapientium convivium* 4, ed. Frank C. Babbitt, *Moralia*, vol. 2 (London-Cambridge, MA, 1928).

51 See Adolf Dyroff, *Die Tierpsychologie des Plutarchos von Charoneia* (Würzburg, 1897).

52 See Stephen T. Newmyer, *Animals, Rights and Reason in Plutarch and Modern Ethics* (New York-London, 2006), 18.

53 *Bestiarium. The Second-family Latin Text*, XLIV, ed. Willene B. Clark, *A Medieval Book of Beasts. The Second-Family Bestiary: Commentary, Art, Text and Translation* (Woodbridge, 2006), 160; Genesis 30.37-42; John Skinner believes that "the ewes saw the reflexion of the rams in the water, blended with the image of the parti-colored rods, and were deceived into thinking they were coupled with parti-colored males": John Skinner, *A Critical and Exegetical Commentary on Genesis* (New York, 1910), 393; for various explanations of the story, see Scott B. Noegel, "Sex, Sticks, and the Trickster in Gen. 30.31-43: A New Look at an Old Crux," *Journal of Ancient Near Eastern Society*, 25 (1997), 7-17.

54 Roger French, *Ancient Natural History* (London-New York, 1994), 7.

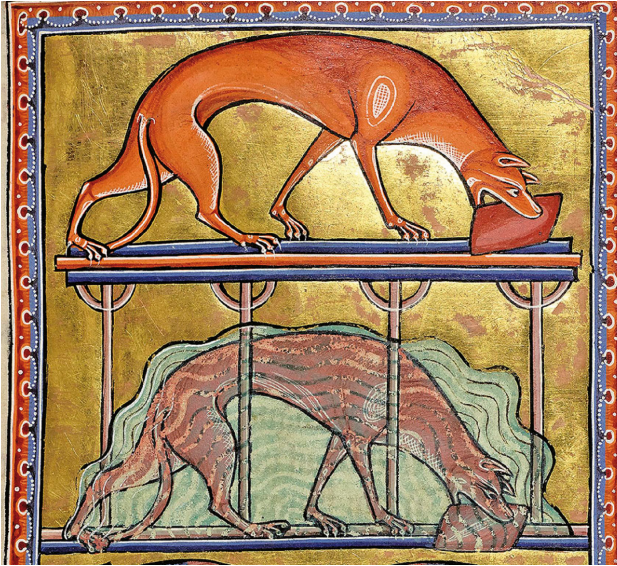


FIGURE 2
A dog and its reflection.
Medieval Bestiary, 1200
AD, *Aberdeen Bestiary*,
MS 24, folio 19r. <[http://
www.abdn.ac.uk/
bestiary/ms24/f19r](http://www.abdn.ac.uk/bestiary/ms24/f19r)>,
last accessed 08.05.2019.

its mouth, sees its own reflection in the water. Mistaking its reflection for another dog, and hoping to take the second piece of meat from its rival, it opens its mouth, dropping and losing its haul in the process. Of course, the story is an allegory of greed (*pleonexia*) leading to loss; however, this does not preclude the possibility of the observation itself being scientific in nature.⁵⁵ In the following century, the philosopher Democritus alluded to Aesop's dog crossing the stream, and later on, many Greek and Roman writers treated this story with all seriousness as a behavioural observation.⁵⁶

It does not seem that dogs were attributed with extensive perceptual or self-recognition abilities in Antiquity. Dogs were described as barking at images of their own species, and males as trying to jump on painted representations of females.⁵⁷ The story about the dog that did not recognise its own reflection was much repeated in medieval bestiaries and encyclopaedias.⁵⁸ The fact

55 Aesop 133; Phaedrus 1.4, ed. Ben Edwin Perry (London-Cambridge, MA, 1965).

56 Democritus B 224, Diels-Kranz, *Die Fragmente der Vorsokratiker*, ed. Hermann Diels, Walter Kranz, 3 vol. (Berlin, 1951-1952); See Gert-Jan van Dijk, *Ainai, Logoi, Mythoi: Fables in Archaic, Classical, and Hellenistic Greek Literature with a Study of Theory and Terminology of the Genre* (Boston, MA-Leiden, 1997), 320, n. 45.

57 Athenaeus, *Deipnosophistae* 605ef; Valerius Maximus 8.11.4.

58 See, for example, *The Aberdeen Bestiary*, f.18r.-20v, Aberdeen University Library, Univ. Lib. MS 24; see also Latini, *The Book of the Treasure*, l.1, c.184, Vincentius Bellovacensis *Speculum naturale* l.19, c.10.

that contemporary naturalists refer to it indicates its timeless popularity (see fig. 2).⁵⁹

8 The Bird: *ornis, orneon/avis*

Another group of animals that did not successfully complete the mirror test in Antiquity is birds. Clearchus of Soli, who was Aristotle's student and the author of a now lost work on animals, provides significant information about the sparrow, partridge, rooster and quail (*strouthos/passer, perdix, alektōr/gallus, ortyx/coturnix*) in his work entitled *On Panic*. He stated that, if a mirror is placed in front of the males during the mating season, the birds will dart towards the mirror, thinking that they are seeing other birds, releasing semen on the way. According to Clearchus, roosters are the only birds that do not get aroused, but instead react belligerently at the sight of their own reflection.⁶⁰ Additionally, the philosopher provided a method for hunting jackdaws (*koloiōs/monedula*) by using a goblet filled with oil – the birds, when they are standing on the rim of the container, will look down and throw themselves at their own reflections, believing them to be other birds from their species. As both Clearchus and Aelian attest, jackdaws have cordial feelings for the birds from their own species and seek their company.⁶¹ Clearchus' words are 'illustrated' with a mosaic from Pompeii from the beginning of the first century BC, which depicts a partridge taking a mirror out of a basket (see fig. 3).

In the Middle Ages, the ancient method of hunting birds using a mirror or a container filled with oil was adopted for the hunting of starlings and pheasants – two species that also failed the mirror test. A Byzantine scholar from the twelfth century, Tzetzes, wrote that jackdaws and starlings (*psar/sturnus*) can be caught if oil is poured onto a plate, because these birds will think they can see another bird from their own species.⁶² Pheasants (*phasianus*), as a medieval work on hunting argues, can also be hunted with a mirror. The *Livre de chasse du roy Modus* (1379 AD) describes how a pheasant may be trapped by

59 See, for example, David R. Major, *First Steps in Mental Growth. A Series of Studies in the Psychology of Infancy* (New York-London, 1906), 268; John Archer, *Ethology and Human Development* (New York, 1992), 215.

60 Athenaeus, *Deipnosophistae* 389f (Clearchus fr. 36, ed. Fritz Wehrli, *Die Schule des Aristoteles. Texte und Kommentar*, Basel, 1969).

61 Athenaeus, *Deipnosophistae* 393ab (Clearchus fr. 3, ed. Fritz Wehrli); Aelianus, *De natura animalium* 4.30.

62 Tzetzes, *Chiliades* 4.3, ed. Petrus Aloisius M. Leone (Naples, 1968).



FIGURE 3

A rock partridge plucking a mirror from a toilette basket. Mosaic from the House of the Labyrinth, Pompeii, early first century BC, Naples. Museo Nazionale: inv. 9980. From Rabun Taylor, *The Moral Mirror of Roman Art* (Cambridge, 2008), 53 (photograph: Alinari/ Art Resources, NY).

propping up a cage with a mirror (see fig. 4). The pheasant, thinking he sees another male pheasant, will attack and bring down the cage.⁶³

It may be assumed that, in Antiquity and the Middle Ages, many other bird species were observed reacting to their own reflections in a manner similar to the abovementioned sparrows, partridges, roosters, quails, jackdaws, starlings and pheasants. Some indirect evidence for this has been preserved, such as records of pigeons (*peleia/columba*) flying over to join painted pigeons, and ganders that tried to mate with painted geese (*chēn/anser*).⁶⁴ A well-known fable by Aesop tells of a pigeon that wanted to drink water from a picture of a container.⁶⁵ Brunetto Latini's encyclopaedia from the thirteenth century notes that pigeon-owners used the most beautiful painting of a pigeon that could be made, so that the birds would produce chicks that were similar to the portrait placed before them (as in an invocation of sympathetic magic).⁶⁶ In the Middle Ages, mirrors were often placed next to a parrot in a richly decorated cage, most likely to induce the bird to play with 'another bird'.⁶⁷

A significant piece of information is preserved in the *Historia naturalis* and expanded upon in the Middle Ages. Pliny the Elder wrote that birds could see their own reflections in the pupil of a human eye, but that these would

63 *Le Livre du Roy Modus et de la royne Racio*, ed. Eléar Blaze (Paris, 1839), 283, 286.

64 Athenaeus, *Deipnosophistae* 605ef; Clemens Alexandrinus, *Protrepticus* 4.57.4.

65 Aesop 201.

66 Latini, *The Book of the Treasure*, 1.1, c.156.

67 See Walker-Meikle, *Medieval Pets*, 51.

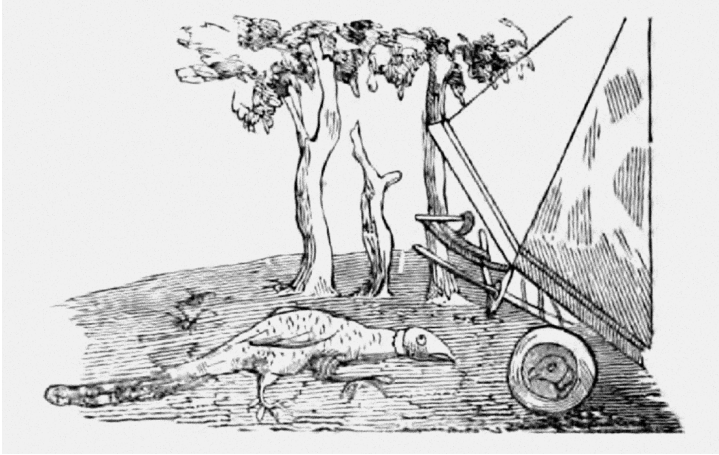


FIGURE 4 The pheasant depicted as a bird that can be trapped using a mirror. *Le Livre du Roy Modus et de la royne Racio*, 1379 AD, ed. Elzéar Blaze (Paris, 1839), 283. <<https://archive.org/details/lelivreduroymodoounkngoog/page/n282>>, last accessed 08.05.2019.

mistaken for other birds of their own species. Thus, when they found themselves close to a human, they would start pecking them in the eyes, thinking they were thereby attacking another bird (*ea causa est, ut pleraeque alitum e manibus hominum oculos potissimum adpetant, quod effigiem suam in iis cernentes velut ad cognata desideria sua tendunt*).⁶⁸ A medieval encyclopaedist wrote that this is what the majority of birds would do, hinting that this was not a behaviour noted from direct personal observation. Ancient sources also contain information about ravens (*corax/corvus*) that pecked out the eyes of bulls, donkeys and oxen.⁶⁹ This observation is supplemented by medieval accounts in which, when the raven finds a dead human, it will first eat the human's eyes and then the brain.⁷⁰

9 The Ape and the Monkey: *pithēkos, simia*

In ancient literature, the mirror also appears in descriptions of monkey hunting in India (the ancients did not differentiate between the terms *ape* and

68 Pliny, *Historia naturalis* 11.55.

69 Aristophanes, *Aves* 582-584, eds. Frederic W. Hall and William M. Geldart (Oxford, 1907); Aristotle, *Historia animalium* 609b; Aelianus, *De natura animalium* 2.51.

70 Latini, *The Book of the Treasure*, 11, c.157.

monkey; therefore, the term *monkey* will be used collectively henceforth). Sources mention many huge and multi-coloured monkeys. Such information has been preserved in the works of a few authors who probably relied on accounts, subsequently lost, of the writers accompanying Alexander of Macedon during his march on India (Onesicritus, but possibly also Nearchus or Aristobulus).⁷¹ We have little information to identify the type of monkeys that were hunted, but it can be assumed that they were langurs – specifically, Hanuman langurs (*presbytis entellus*). Apart from them, the ancient texts most often refer to macaques (Barbary macaques).⁷²

The hunts proceeded as follows: when a monkey was present and watching, the hunter would sling a mirror onto his own neck, and then take it off and move away from it. The monkey would imitate the hunter: it would hang the mirror on a string around its neck and when it looked into it, it would effectively put itself on a leash. In another variation, the hunter looks into a mirror, which is then discreetly swapped with a different object that is smeared with a sticky substance. If the monkey cannot see its reflection in the supposed mirror, it then puts its face closer to the object's surface, and the substance seals its eyelids.⁷³ Unfortunately, these sources are not clear and conclusive, and the ancient authors do not inform us as to whether or not the monkeys were able to recognise their own reflections.

Nonetheless, the ancient descriptions are reflected in the medieval motif of monkeys robbing the baggage from peddlars who are taking a nap after a journey. Depictions have survived of monkeys playing with the objects that were earlier laid as traps for them. We see them calmly looking at themselves in round mirrors. Sometimes, we can even notice a reflection of the mouth of a monkey (fig. 5).⁷⁴ What does the monkey see in the mirror? A rival or a mate? Or maybe himself?

Images of monkeys looking into a mirror were also very popular in the Middle Ages for another reason. A monkey, fascinated with its own reflection in a mirror, illustrated the concept of vanity (*vanitas*), pride, self-love and folly.⁷⁵ As William Coffman McDermott noted, the monkey was called “the ugliest

71 See Andrew M. Chugg, *Concerning Alexander the Great. A reconstruction of Cleitarchus* (United States, 2015), 632.

72 See McDermott, *Ape in Antiquity*, 72-76; Gościwił Malinowski, *Zwierzęta świata antyczne-go. Studia nad Geografią Strabona* (Wrocław, 2003), 119-120.

73 Cleitarchus, *FGrHist* 137 F 19, *Die Fragmente der Griechischen Historiker*, ed. Felix Jacoby (Berlin, 1923 ff); Diodorus Siculus, *Bibliotheca historica* 17.90.1-3, ed. Charles Henry Oldfather, 12 vols. (London-Cambridge, MA, 1946-1967); Aelianus, *De natura animalium* 17.25.

74 Bonnie Young, “The Monkeys and the Peddler” *The Metropolitan Museum of Art Bulletin*, 26 (1968), 443, fig. 3, 4, 5, 19.

75 Horst Woldemar Janson, *Apes and Ape Lore in the Middle Ages and the Renaissance* (Lon-



FIGURE 5 The monkeys and the peddler. Engraving, 1470-1490 AD, Topkapı Palace Museum, Istanbul, H.2153, folio. 145. From Bonnie Young, "The Monkeys and the Peddler," *The Metropolitan Museum of Art Bulletin*, 26 (1968), 441-454. <<https://www.metmuseum.org/pubs/bulletins/1/pdf/3258815.pdf.bannered.pdf>>, last accessed 08.05.2019.

animal" (*turpissima bestia*).⁷⁶ Because of their ugliness, they were identified with negative characteristics. The mirror in the Middle Ages became central to the symbolic expression of these attributes: a woman admiring her reflection in a mirror, a peacock surrounded by mirrors or a monkey looking into the mirror were motifs frequently painted to represent the abovementioned manifestations of sinfulness. According to Sabine Melchior-Bonnet, a monkey carrying a mirror was "an incarnation of the bestial impulses of sensuality, of imitation, and of inconstancy."⁷⁷ In *The Mirror. A History* she evokes the example of a "German wood engraving which shows a woman who caresses a man's penis with one hand and steals his money with the other; above the man, a monkey holds up a mirror." This monkey with the mirror was seen as a symbol of slavish devotion to sensuality.⁷⁸ In sermons from the fourteenth and fifteenth century, a convex mirror scattering the sun's rays represented wasteful illusions of vanity, but a concave mirror that focusses these rays represented spiritual light.⁷⁹

don, 1952), 212-213; Donat de Chapeaurouge, *Einführung in die Geschichte der christlichen Symbole* (Darmstadt, 2012), s.v.: "Affe."

76 McDermott, *Ape in Antiquity*, 147.

77 Sabine Melchior-Bonnet, *The Mirror. A History*, trans. by Kathrine H. Jewett, preface by Jean Delumeau (New York-London, 2001), 197.

78 Guy de Tervarent, *Attributs et Symboles dans l'art profane* (Genève, 1959), 354.

79 Hervé Martin, *Le Métier de prédicateur* (Paris, 1989), 445; cf. *The Mirror of the Medieval. An*



FIGURE 6
A monkey looking at itself
in a mirror. *Isabella
Breviary*, Bruges, c. 1497
AD. British Library, MS
Add 18851, folio 270, from
Joana Antunes, *Corpos
marginados na arte
medieval*, *Artes e Ciências
do Património* 2015, 90.



FIGURE 7
The monkey with the mir-
ror. *Book of Hours*,
Belgium, c. 1490. The
Morgan Library and
Museum, MS S. 7 folio
65v. <[ica.themorgan.org/
manuscript/
page/40/161023](http://ica.themorgan.org/manuscript/page/40/161023)>, last
accessed 08.05.2019.



FIGURE 8
The hunter and the ape.
Johann Bämmler (Augsburg,
1477). From Albert
Schramm, *Der Bilders-
schmuck der Frühdrucke*,
vol. 3: *Die Drucke von
Johann Baemler in
Augsburg*, (Leipzig, 1921),
plate 75, figure 529.
<<http://digi.ub.uni-heidelberg.de/diglit/schramm1921bd3/0109>>, last
accessed 08.05.2019.

It is not surprising, therefore, that in the figures depicting a monkey with a mirror, the mirror is convex (see figs. 6 and 7).

Melchior-Bonnet further notes that, “a common iconographical image of the mirror from the Middle Ages to the Renaissance is that of a monkey who copies and ridicules everything he sees.”⁸⁰ In a sense, the mirror, by showing the spectator an image of how they are seen by others, forces an imitation of the behaviour of others, and encourages a preoccupation with external appearances. Janet Ravenscroft quoted Sebastián de Covarrubias who wrote that “someone who tried and failed to be like his or her betters was referred to as a ‘monkey’ [...] an ‘abominable’ and ‘ugly’ monkey looking into a mirror and finding herself beautiful.”⁸¹ Thus, the mirrors gave an illusory picture of reality, and people, like the monkeys with their mirrors, followed blindly and were fascinated by this delusion. Hence the mirror-based iconography around the sin of vanity. The perils of mirror-gazing are vividly depicted in Horst W. Janson’s description of Johann Bämmler’s illustration (1477) showing men hunting for apes (fig. 8):

An ape, fleeing from a hunter and his dogs, comes to a body of water, in which he sees a reflection of himself, and becomes so fascinated with his

Anthropology of the Western Historical Imagination, ed. K. Patrick Fazioli (Berghan Books, 2017), *passim*.

80 Melchior-Bonnet, *The Mirror*, 192.

81 Janet Ravenscroft, “Invisible friend: questioning the representation of the court in Habsburg Spain,” in Waltraud Ernst, ed., *Histories of the Normal and the Abnormal. Social and Cultural Histories of Norms and Normativity*, 26–52 (London–New York, 2006), 42; See Sebastián de Covarrubias, *Tesoro de la lengua castellana o española*, ed. Martin de Riquier (Barcelona, 1998), 81.

mirror-image that he simply sits down and stares at it, so that the hunter overtakes him unawares.⁸²

10 The Tiger: *tigris*

Accounts dating from the time of the Roman Empire would say of the tiger that it would not see a rival when looking into a mirror. Ancient authors, from the first century AD onwards, give descriptions of hunting for tiger cubs. Tiger hunting was a Roman idea that was completely unknown to the Greeks. At the end of the third century AD, the first depiction of hunting with the use of a convex mirror (*sphaera*) appears in Roman art; in the following century, the motif can also be found in the literature.⁸³ After kidnapping the tiger cubs and running away with them, the hunter would throw glass balls to the tigress in order to try to slow her down and make certain the escape. According to the beliefs of the ancients, the tigress saw miniature versions of herself when looking into the glass balls and thought she was seeing her own progeny.⁸⁴ In a Roman mosaic from the fourth century AD, we can see a tigress looking into a glass ball containing the image of a small tiger (see fig. 9). The value of the abovementioned testimonies of tiger hunting is open to question, however, given the fact that the Romans imported tigers from distant lands (Hyrcania, India), and we do not know how many Romans actually saw tiger hunting outside of depictions of the activity in art.

Ancient ideas about tigers persisted into the Middle Ages, as confirmed by Albertus Magnus in the work *De animalibus*, and as can be seen in medieval artworks (see fig 10).⁸⁵ It became an inspiration for the authors of bestiaries, who claimed that a tigress would give up chasing after the hunter who stole her cubs because she could not stop herself from admiring herself in the mirror.⁸⁶

82 Janson, *Apes*, 212.

83 Alexander P. MacGregor, "The Tigress and Her Cubs: Tracing Down a Roman Anecdote," in Robert F. Sutton Jr., ed., *Daidalikon. Studies in Memory of Raymond V. Schroder, S.J.*, 218-227 (Wauconda, IL, 1989); George Jennison, *Animals for Show and Pleasure in Ancient Rome* (Philadelphia, PA, 1936), 147.

84 Ambrosius, *Hexaemeron* 6.4.21, eds. Richard C. Dales and Servus Gieben (London, 1982); Claudianus, *De raptu Proserpinae* 3.263-268, ed. Claire Grunzelier (Oxford, 1993).

85 Albertus Magnus, *De animalibus* 22.138, ed. Herman Stadler (Münster, 1916-1920).

86 *Bestiarium*, chapter 11, "De tigre," Clark, *A Medieval Book*, 122; Pierre de Beauvais, *Le Bestiaire (version longue)*, in Charles Cahier and Arthur Martin, eds., *Mélanges d'archéologie, d'histoire et de littérature*, vol. 2, 106-232 (Paris, 1851); The "Cambrai Bestiary," in Guy. R. Mermier, ed., *A Medieval Book of Beasts: Pierre de Beauvais* (Lewiston, MA, 1992), 312; Rich-



FIGURE 9 The 'mirror-trap': a tigress deceived by her own reflection in the Great Hunt mosaic, Piazza Armerina, c. 305 AD. After: Patrizio Pensabene and Enrico Gallochio, 'The villa del Casale of Piazza Armerina', *Expedition* 53, 2 (2011), 29-37. <<https://www.penn.museum/documents/publications/expedition/PDFs/53-2/pensabene.pdf>>, last accessed 08.05.2019.



FIGURE 10 A tigress looking at a mirror, seeing her cub. *Medieval Bestiary*, 1200-1210 AD. British Library, Royal MS 12 C XIX, folio 28r. Catalogue of Illuminated Manuscripts, from Raysa Barbosa Corrêa Lima Pacheco, *A presença do animal na produção contística e cinematográfica de Gabriel García Márquez (saberes animais e bestiários)*, Uberlândia 2016, 65.

ard de Fournival, *Li Bestiaires d'amour*, in Cesare Segre, ed., *Master Richard's 'Bestiary of Love' and Response*, trans. Jeanette Beer, (Berkeley, CA, 1986), 14; Latini, *The Book of the Treasure*, l.1, c. 196.

The belief seems to have prevailed therefore that the tigress would recognise herself in her own mirror reflection.⁸⁷

Medieval accounts also note the reaction of a common cat (*felis, catus, musio*) to its own reflection in a mirror. Albertus Magnus wrote that the cat would start playing when it saw itself in a mirror or in water, indicating that it was not possessed of the self-recognition abilities observed in its feral relative.⁸⁸

Concluding Remarks

Even though the ancients did not methodically observe the reactions of animals to their own reflections in a mirror, the extant sources cited above amply indicate their interest in this subject. Observations were made, first and foremost, during work with animals in and around the house, as well as when hunting and playing with domestic animals. The conclusions the ancients drew were not limited to practical purposes; after all, they appeared in morality tales, which indicates that they looked for human traits in the animal kingdom. As we have tried to document, the influence of Antiquity on medieval beliefs was significant.

Contemporary studies seem to confirm the ancient and medieval observations which indicate that the dogs and birds mentioned in this article do not recognise their own mirror reflections. However, gauging the responses of horses and monkeys is more problematic. Ancient and medieval sources were inconclusive on the self-perception abilities of these animals, but a recent pilot study has shown that “horses are able to perceive that the reflected image is incongruent when compared with the memorized information of a real horse.”⁸⁹ All anthropoid apes, in contrast to monkeys, are capable of passing the mirror test. However, the latest findings indicate that monkeys can possibly “reach a level of self-other distinction intermediate between seeing their mirror image as other and recognizing it as self.”⁹⁰ Contemporary evidence for the high perceptual abilities of mules and tigers is still lacking and these animals have so far failed the mirror test. Other animals at the centre of contemporary

87 For a depiction of a tigress in front of a mirror, looking at her own reflection, see *Medieval Bestiary*, 1225-1250 AD. Oxford, Bodleian Library, MS. Bodley 764, folio 6v.

88 Albertus Magnus, *De animalibus* 22.121.

89 Paolo Baragli, Elisa Demuru, Chiara Scopa and Elisabetta Palagi, “Are Horses Capable of Mirror Self-recognition? A Pilot Study,” *PLoS One*, May 16 (2017), 1-16.

90 Frans B.M. de Waal, Marietta Dindo, Cassiopea A. Freeman and Marisa J. Hall, “The Monkey in the Mirror: Hardly a Stranger,” *Proceedings of the National Academy of Sciences of the United States of America*, 32 (2005), 11140-11147.

mirror-test research – the dolphin, killer whale, elephant or the magpie – are species for which there are no ancient or medieval accounts.

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