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Elephas anthropogenus

Uli Westphal*

Kuglerstr. 31, 10439 Berlin, Germany

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ABSTRACT

This paper and its accompanying artwork examines the history of our perception of nature based on the example of elephants (*Elephas maximus*, *Loxodonta africana*, *Loxodonta cyclotis*). With the fall of the Roman Empire up until the late Middle Ages, elephants virtually disappeared from Western Europe. Since there was no real knowledge of how these animals actually looked, illustrators had to rely on oral, pictorial and written transmissions to morphologically reconstruct an elephant, thus, reinventing the image of an actual existing creature. This led, in most cases, to illustrations in which the most characteristic features of elephants – such as trunk and tusks – are still visible, but that otherwise completely deviate from the real appearance and physique of these animals. In this process, zoological knowledge about elephants was overwritten by its cultural significance. Based on a collection of these images I have reconstructed the evolution of the '*Elephas anthropogenus*', the man made elephant.

1. Introduction

In my work, as a visual artist I deal with the way humans perceive, depict and transform the natural world.

Scientific surveys provide one of many possible approaches to observe and interpret nature. Depending on one's perspective, nature can have a subjective, religious or cultural meaning. Nature can be perceived as a threat, as a resource or as a sanctuary. Certainly, this perception varies from person to person, but we also discern how human perception of nature has been shaped by different cultural currents and ideologies through different phases of history. This paper investigates how our image of nature has changed over the centuries and analyzes the effects that different perspectives project upon the representation and perception of nature. I examine these exemplary aspects of human projection by looking at the depiction of a single animal representative: the elephant. (*Elephas maximus* (Linnaeus, 1758), *Loxodonta africana* (Blumenbach, 1797), *Loxodonta cyclotis* (Matschie, 1900)).

Elephants were well known in antiquity. In ancient Rome, for example, elephants were frequently used as a motif on coins, as entertainers in circuses and as work animals that drew carriages in triumphal processions (Lach Donald, 1994, p. 127). As such, elephants were part of everyday life. After the fall of the Roman Empire, however, elephants virtually disappeared from Western Europe (Lach Donald, 1994, p. 130). Since there was no real knowledge of how this animal actually looked, illustrators had to rely on oral, pictorial and written transmissions to morphologically reconstruct the elephant, thus reinventing the image of an actual existing creature. This led, in most cases, to illustrations in which the most characteristic features of an elephant – trunk, tusks, ears – are still visible, but that otherwise completely deviate from the real appearance and physique of this animal. These illustrations offer the opportunity to observe how a natural phenomenon, the elephant, was culturally reconstructed and reinterpreted. In this process, zoological knowledge about the elephant was overwritten by its cultural significance.

I have developed a tree diagram that traces the evolution of the elephant depiction throughout the middle ages up to the age of enlightenment. This diagram is based on a collection of over 170 illustrations which are classified according to taxonomic principles. The work is entitled 'Elephas anthropogenus', a neologism, consisting of the words *Elephas* (the genus name of Asian elephants, *E. maximus*), anthropogenic (made by humans), and the word genus (a term from the zoological nomenclature). The term is used here to describe all elephants whose morphology is based on human imagination. (I chose the word *Elephas* as part of this neologism, simply because its reference to the word elephant is immediately recognizable, not because the illustrations are based only on Asian elephants. In fact, both Asian and African elephants have influenced the elephant depictions. In some cases, one can still clearly recognize individual morphological traits of the different species. However, many of the more simplified and imaginative illustrations

* Corresponding author. Tel.: +49 1707555121.
E-mail address: uliwestphal@gmail.com

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from the middle ages do not carry enough information to clearly distinguish between species. They only allow to deduce that they depict an elephant because they show general striking body features of elephants. Because species distinction is not immediately relevant for the subject of this paper, I use the word elephant as representing both Asian and African elephant species.)

This paper and its accompanying artwork present two fundamentally different modes of our perception of animals: the cultural perspective in which the elephant itself has a specific meaning within the context of society, its belief systems and culture; and the scientific perspective that looks at the elephant as a biological organism, at its morphology and evolution.

2. The developmental history of the elephant's cultural significance in Western Europe

2.1. The elephant in antiquity

2.1.1. Aristotle

The first recorded contact between Western Europeans and Indian elephants derives from the battle of Alexander the Great (356–323 BC) against Darius the 3rd (c. 380–July 330 BC) in Arabela, 331 BC. During its conquest of the Persian Empire, Alexander's army allegedly captured numerous war elephants and brought them back to Greece. Alexander was a pupil of Aristotle (384–322 BC), and it is likely that Aristotle saw an elephant in real life (Lach Donald, 1994, p. 125). Aristotle wrote massive encyclopedic works on the animal kingdom. His descriptions are relatively realistic and very detailed. He describes in detail the body and the anatomy of the elephant, even parts of his intestines (Aristotle, 350 BCa). Some rather curious elements of Aristotle's descriptions are, however, of particular importance in how they may have transformed the elephant into a mythological creature. For example, Aristotle says that elephants become 200–300 years old (Aristotle, 350 BCb), that they are very chastely, mate only in remote places close to rivers and give birth to only one young (Aristotle, 350 BCc).

2.1.2. Pliny

Approximately 400 years after Aristotle, the Roman scholar Gaius Plinius Secundus (23–79 AD) (short: Pliny) compiled the 37-volume encyclopedia *Historia naturalis*. The *Historia naturalis* was a popularized collection of mainly Greek texts that served to entertain the Roman upper classes (Principe, 2002a). Besides scientific facts, it also included elements from folklore and mythology. The *Historia naturalis* was written in Latin, which later became the language of the sciences, and it was one of the most influential literary works up to modern times. Pliny's descriptions of the elephant form the foundation from which the majority of myths about the elephant were developed in the following centuries (Principe, 2002b).

Pliny copied from Aristotle the great age of the elephant, saying that elephants are very chastely, that they mate only in remote places and then wash themselves clean in a river. He reduces the potential offspring of the elephant to a single baby, once in its lifetime. He says that elephants are religious and pray to the moon. He describes the role of elephants in war and says that they wear wooden towers with up to 60 warriors on their backs. He speaks at length about the deep enmity between the dragon and the elephant and describes how the dragon, on hot summer days, lurks in the water, waiting for the elephant, in order to feast on its cool blood (Plinius Secundus, 77 AD).

2.2. The Physiologus and the Beastiaries

In the fourth century AD, a book called the *Physiologus* appeared in Alexandria (Arnott and Beaven, (n.d.)). It was a collection of descriptions of partly real, partly mythological animals that functioned as carriers of allegorical meanings or morals in relation to man. In the 6th century, Christian moralizations were added to the *Physiologus*. Christianity developed the *Physiologus* into a powerful, didactic tool to teach the history of salvation, in which animals and their characteristics could communicate something about the divine plan. The *Physiologus* was not a fixed, unchanging scripture, but rather a concept, a method of animal description, and its contents continued to develop with each new version.

Drawing from the influence of the *Physiologus*, the so-called bestiaries were developed over the next centuries. Bestiaries were very similar to the *Physiologus* in structure and function, but contained much richer illustrations (Beckhöfer-Fialho, 1996). A majority of the illustrations that I collected for my work, *Elephas anthropogenus*, were procured from the bestiaries of the 14th and 15th centuries. Both the *Physiologus* and the bestiaries describe the elephant as having some standard elements, which were then repeated over and over with only slight variations:

Elephants have very cool blood and therefore have no bodily desire. Although they become up to 300 years old, they only give birth to a single cub. When the time of conception is near, they wander into the earthly paradise where the Mandrake tree grows. The female begins to eat of its fruit and seduces the male to do the same. Only then will they mate. The female gives birth in the water, in order to protect it's cub from the eyes of the dragon, which lurks on the shore. Elephants have no joints in their legs and therefor can not stand up by them selves, should they ever fall. Therefore, they must sleep standing up and lean themselves against a tree. If a hunter wants to catch an elephant, he saws a slit in the tree and waits until the elephant comes to lean on it. The tree then breaks and the elephant falls to the ground. If the hunter is not present in order to kill him, the elephant starts calling for help. Twelve more elephants come to try and raise up the fallen elephant, without success. Then a small elephant arrives, puts his snout under the belly of the fallen elephant and lifts him up again (Druce, 1919, p. 7).

Many elements of this story are based, directly or indirectly, on the descriptions of Pliny's *Historia naturalis*. What really differentiates this text from the *Historia naturalis*, is a passage that gives a religious meaning to the story:

The male and female elephant symbolize Adam and Eve who were innocent until they ate from the tree of wisdom and were expelled from paradise. They gave birth to their son Cain over the waters of shame where the devil (the dragon) waited for him to entice and lead him astray. The fallen elephant symbolizes mankind which was brought to fall by the tree of wisdom. The twelve elephants who came to help him are the prophets, who unsuccessfully tried to lift mankind out of the depths of sin. The little elephant is Christ himself who became man and thus himself small and humble and who sacrificed himself to redeem humanity (Druce, 1919, pp. 7 and 8).

As bizarre as this description may seem in how it correlates the elephant with Christ himself, this passage illustrates the irrelevance of zoological facts in how nature was to be understood during the Middle Ages. It seemingly did not matter how animals looked, as much as it mattered what they symbolized, or meant.

2.3. The herbal books

Another context in which elephant illustrations emerged during the Middle Ages was provided through the herbal books. The herbal books, in contrast to the bestiaries and the *Physiologus*, can be seen more as scientific literature. They gave nature an earthly function and described the medicinal properties of plants and their benefits to humans. The elephant was included in these books because it was, through Christian mythology, firmly connected to the mandrake tree, whose fruits or roots were thought to possess aphrodisiac properties. Also, the blood of the elephant and its ivory

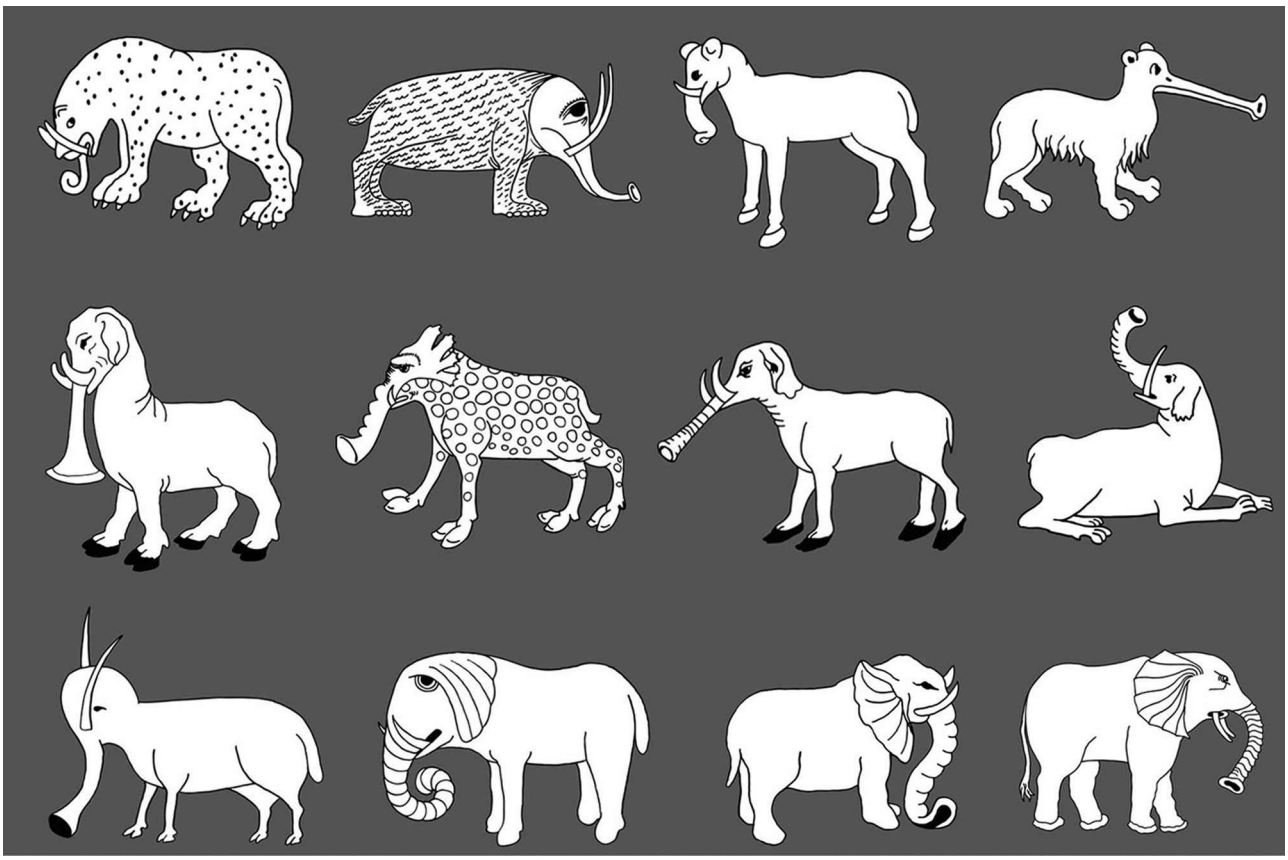

Fig. 1. Examples of various historic elephant depictions reduced to simple line drawings.
Sources, from left to right, top to bottom:
- Anonymus, 1025–1050. MS Cotton Tiberius B V, part 1, f. 81r. British Library.
- Anonymus, 13th–14th Century. MS O.2.14, England, Trinity College, Cambridge.
- Anonymus, 2nd half of the 14th century. Speculum humanae salvationis, The Netherlands, f.27, British Library.
- Ovide, circa 1385. Métamorphoses/Ms 742, f. 79v, Bibliothèque municipale de Lyon.
- Anonymus, early 15th century. MS Royal 20 B.XX, f.57, British Library.
- Von Megenberg, Konrad, circa 1442–1448. Buch der Natur, f. 95r, Universitätsbibliothek Heidelberg.
- Anonymus, before circa 1445. Shrewsbury Talbot Book of Romances/Royal 15 E. VI, Frane, f.16v, British Library.
- Jean, Wauquelin, 15th century. Histoire d'Alexandre/Français 9342, Belgium, f.149v, Bibliothèque nationale de France.
- Anonymus, 15th century. Français 19,081, France or Belgium, f.181v, Bibliothèque nationale de France.
- Van Cantimpres, Thomas, circa 1500. De natura rerum, Bruges. Printed in Frankfurter Allgemeine, Das Netzwerk der Mönche, 10. September 2002.
- Münster, Sebastian, 1552. Cosmographia/Book V, Basel, p. 1066.

tusks, when milled into powder, were thought to provide remedies against various ailments (Druce, 1919, pp. 50 and 51).

The herbal books contained specific instructions for the preparation of ointments and remedies and for the identification of plants. They offered little space for variation and reinterpretation of its contents, in contrast to the *Physiologus* and the Bestiaries. As a consequence of this design limitation, the illustrations contained in the herbals were extremely consistent. The elephant was therefore represented in very similar ways, often as an Artiodactyla, with skinny, goat-like legs, a round head, light brown skin and tusks peaking out of its trunk. It is striking to note that the elephant image was not integrated into particular scenes or natural settings, but rather was shown on a white background, isolated and detached. In this manner, the elephant was removed from its symbolic context and illustrated in a rather scientific way.[1]

2.4. Elephants in the context of war

Probably the best known and most frequently used motif in medieval representations of the elephant, is the elephant that carries a castle on its back. It is found in almost all literary genres of the time, in architectural ornaments of cathedrals and castles, in painting and iconography of the early Middle Ages up until the late Renaissance. 30% of all elephants contained in my collection originally had a fortress or a tower mounted on their backs. This figure shows how much the image of the elephant was, next to its religious meaning, nestled in the context of warfare and thus served to illustrate historical events. Origins of this motif can be found in the battles of Alexander the Great, on which an own literary genre, the Alexander Romance, is based.

[1] Examples of such depictions can be found in the following manuscripts: (1) Manuscript 10 D 7, France, circa 900–1000, f.88r, in the collection of the Koninklijke Bibliotheek van Nederland. (2) Platonicus, Apuleius, circa 1025: The Herbarium of Apuleius Platonicus, Canterbury, UK, f.32v, in the collection of the British Library. (3) Testard, Robinet, 15th Century: Book of Simple Medicines, Ms Fr. Fv VI #1, f.168v, in the collection of the National Library, St. Petersburg. (4) Manuscripts of the collection of the Bibliothèque nationale de France, Département des Manuscrits, Division occidentale: Français 9137, Bourgogne France, 1450–1500, f.280v, Français 1312, France, circa 1450, f.27v, Français 12320, northern France, circa 1450, f.178v, Français 12319, northern France, 1450–1475, f.285v, Français 1307, France, 1480, f.221v and Français 12322, France, 1520–1530, f.193v.

2.5. Elephants during the Renaissance

With the onset of the Renaissance, the depictions of elephants gradually broke from Christian symbolism, but not from the ideas of antiquity. Ironically, Conrad Gesner (1516–1565), who is considered to be one of the founders of modern zoology, copied his multi-page description of the elephant almost word by word from Pliny (Gesner, 1606). The elephant which illustrated his description, is a near identical copy of an engraving by the German artist Martin Schongauer (c. 1440–1491). Also the elephant shown in the book *De quadrupedibus solidipedibus volumen integrum* by famous Italian naturalist Ulisse Aldrovandi (1522–1605) is based on the same depiction (Aldrovandi, 1616). Schongauer's elephant is in his general physique quite realistic, but has fan shaped ears, slanted eyes and an almost mechanical looking, segmented trunk, that emerges from a skin fold beneath it's nose. With the development of engraving at the beginning of the Renaissance the depictions of elephants became increasingly naturalistic and highly detailed. Lack of knowledge of the physical appearance of the elephant could not be hidden anymore by stylized or simplified representations, but took on sharp features. The ideas of antiquity were also a central theme of the motifs. Elephants in triumphal processions, war and hunting scenes were especially popular. During the Renaissance, the elephant was given a Baroque appearance, became a chubby, stocky creature with a curved trunk and pig ears. Presumably the artistic style of this period influenced the representation of the elephant.

2.6. Encounters with real elephants

There were still some encounters with real elephants that were imported as gifts for kings and popes, mostly from Asia. These animals often had to be brought over long land routes from the ports to their destinations and caused great excitement among the population (Lach Donald, 1994, pp. 129–133). Therefore, my collection also includes some realistic pictures of elephants that were based on living specimens. These encounters only had a short temporary effect on the depiction of the elephant, and the knowledge of the elephant's true appearance was quickly overwritten and dominated by traditional ideas of how an elephant should look.

3. *Elephas anthropogenus* from a taxonomic and evolutionary point of view

3.1. The morphology of Elephas anthropogenus

Due to the lack of knowledge of the true appearance of the elephant, and the irrelevance of scientific authenticity for the understanding of nature during the Middle Ages, there were no limitations set to the depiction of the possible morphology of elephants. This led to a rich visual spectrum in the depiction of the elephant. A special phenomenon that appears in many of the illustrations, could be described as hybridization: a process in which unknown, exotic animals were described by combining the body parts of known, domestic animals. The classic medieval elephant had a trumpet-shaped snout, ears like a dog, feet and body like a horse, cow or goat and tusks jutting up from its lower jaw, like those of a boar.

Some origins of morphological misinterpretation can be traced back, at least hypothetically, to series of sequential illustrations that were based on each other. For example, the ears of the elephant are often portrayed as fan-shaped, ribbed structures. This could be due to the fact that the ears of the elephants, especially those of the African elephant (*L. africana*), are permeated with large blood vessels. These swell to cool down excess body heat and then form a structure similar to a net or fan. If the first illustrations of this type were based on an authentic representation of these vein systems, it could be concluded that this detail was expanded in later illustrations, until it had finally developed into a distinctive fan shape.

A similar process could also be the cause of the outwardly open concave elephant ears, which are mainly found in the naturalistic illustrations of the Renaissance. The ear canal of the elephant actually does lie on the outside of the ear, however the ear tends to lay flat and does not have a concave shape like human or horse ears do. Though, due to the shape of the elephants head there is a shadow cast on its ear, which was perhaps interpreted as an opening. From copy to copy this feature has become more pronounced until the elephant ear had developed into a very pronounced concave shape.

3.2. Parallels to biological organisms and to evolutionary processes

Some of the illustrated elephants possess a unique morphology that does not repeat itself, at least not within my collection. However, most pictures have similarities, suggesting a common origin or a family relationship. Until the invention of printing technologies such as wood print or copper engraving, books and the illustrations contained within them were duplicated laboriously by hand. This process led to variations, not exact copies. So also the morphology of the elephant changed continually with each reproduction and formed new features, while other features were lost in this process. Certainly different images also merged into each other and formed hybrids that combined the features of several earlier pictures. The illustrated elephants behave in this process quite like biological organisms and species, in the sense that they have an individual anatomy, they crossbreed, propagate, evolve and develop new traits and characteristics. For this reason, it is possible to describe the *Elephas anthropogenus* according to taxonomic principles, and to reinterpret its development from the perspective of evolutionary biology.

3.3. The classification of the Elephas anthropogenus

For the integration of the elephant depictions into a pseudo-biological system, the images in my collection went through several phases and transformations. First I positioned the images in chronological order, through which its development along a time line became visible.

As a next step, I made simplified line drawings from the elephant illustrations (Fig. 1). The transfer of the illustrations, which were originally crafted in very different styles, into an uniform, reduced representation was necessary to allow for a clear visual comparison, which focused on the actual morphology of the elephant. The isolation of individual species from their surrounding context is also a fundamental method of the natural sciences.

There were several criteria by which I sorted the images: the first criterion was based on the specific taxonomy of the elephant: the shape and position of their feet, trunk, ears and tusks. Based on these features, I was able to arrange the pictures in broad categories. There were, among others, the classes of the fan shaped ears, the trumpet shaped trunks, the cloven-hoofed elephants, the predators and the pig-like. However, with this method of classification according to a certain characteristic, I encountered two fundamental problems: firstly, the selection of the body part that the elephants were to be classified by was arbitrary, depending on whether I judged the animals based on their snout, ears, or feet I ended up with completely different groupings.

When I tried to take into account several characteristics simultaneously, I was faced with the problem that many of the elephants carried the characteristics of different genres. So an elephant that

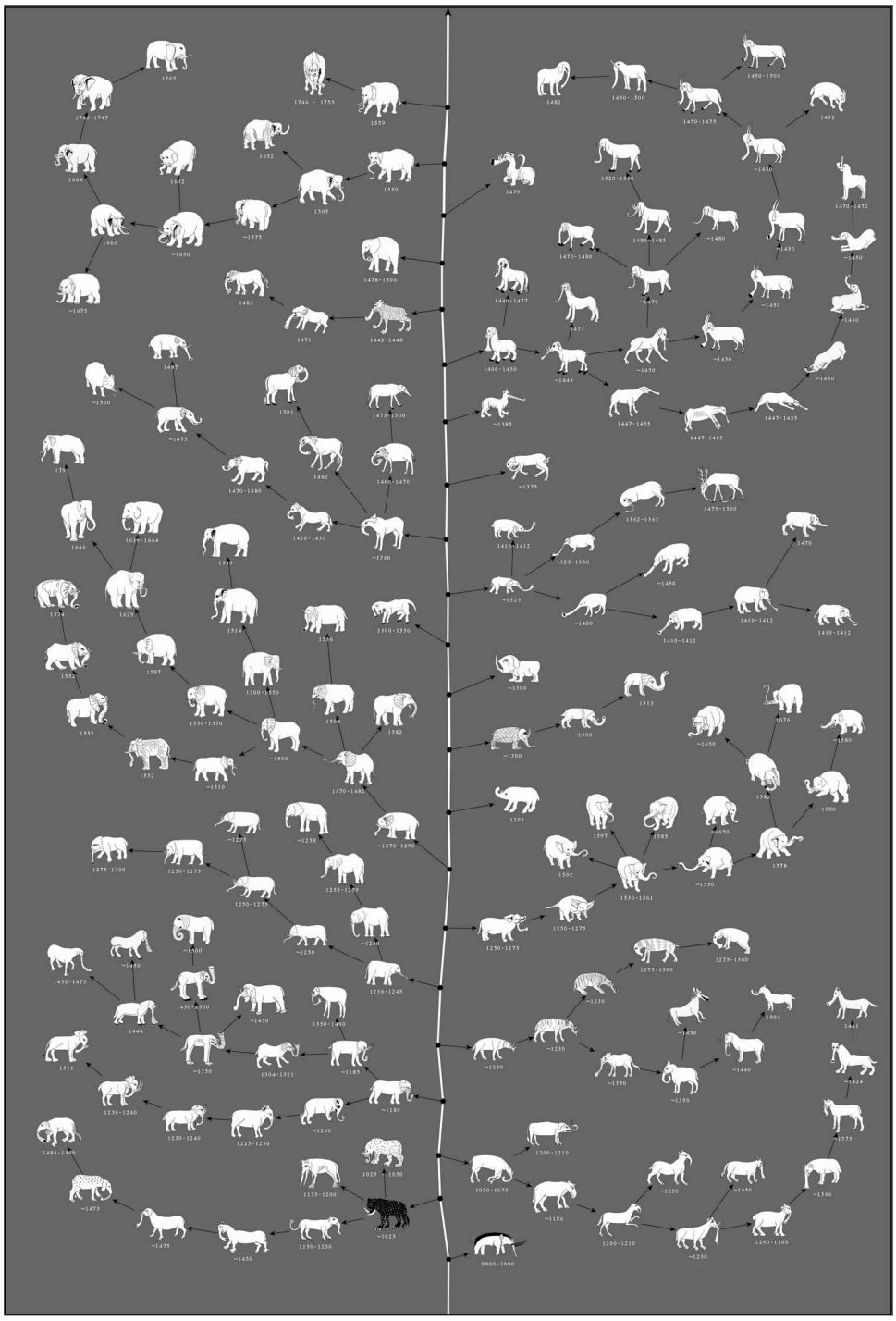

Fig. 2. Type: artwork. Title: *Elephas anthropogenus*. Dimensions: 150 cm × 225 cm. Material: pigment-ink on canvas. Date: 2008. Artist: Uli Westphal. Web: http://www.uliwestphal.de/ElephasAnthropogenus/. Sources of all images, see: http://www.uliwestphal.de/ElephasAnthropogenus/sources.pdf.

had a trumpet shaped trunk but that also had claws like a predator had to be placed into two different groups simultaneously.

I had to compromise and take into account not only individual anatomical features, but in many cases, the overall morphology of the elephant as a classification criterion. The classification into different groups was thus based on the criterion of general morphological appearance, and the similarity between the elephants was used as an indicator that they were in fact related. The lineages that were reconstructed based on this approach are hypothetical, but reflect in some cases the development of depictions that are indeed based on each other (Fig. 2).

3.4. The artificial Systema naturae

Although the *Elephas anthropogenus* is an artificial organism, by classifying it I encountered a fundamental problem that we also face when classifying biological organisms: the randomness of the choice of the underlying classification criterion. Throughout the

history of systematics the natural world has been sorted in a variety of ways. We still search for the *Systema naturae* that was postulated by Linnaeus (1707–1778), a natural system in which each organism can be classified by a universal criterion which reveals its natural position in the tree of life. Until today there is still no uniform definition of the term species. There are several different species concepts, each of which leads to a different classification system. This inconsistency of various species concepts is known as species problem. The scientific picture of nature is not entirely objective; depending on our perspective, different interpretations of the same natural phenomenon are possible.

4. Conclusion

Elephas anthropogenus illustrates the diversity in which nature can be perceived and depicted. It shows 170 variations of the same natural phenomenon. The image that we make of nature ultimately remains an artificial construct whose form is dependent on the function or meaning, which we assign to nature.

5. How to read the accompanying chart

The vertical line that runs through the center of the chart is a time scale. Each cluster of related elephant depictions is connected via a node to this time scale. The age of the earliest elephant depiction within a cluster is the formation date of the cluster. It determines the height of the clusters link to the time scale. In addition, each illustration is labeled with its individual date of origin.

References

Aldrovandi, U., 1616. De quadrupedibus solidipedibus: volumen integrum, Bononiae: apud Victorium Benatium, p. 465. <http://hdl.handle.net/2027/ucm.5319455264?urlappend=%3Bseq=475/> (accessed 25.04.15.).

Aristotle, 350 BCa. The History of Animals. Book II. Translated by Wentworth Thompson, D'Arcy, <http://classics.mit.edu/Aristotle/history_anim.2.ii.html/> (accessed 17.09.14.).

Aristotle, 350 BCb. The History of Animals. Book VIII. Translated by Wentworth Thompson, D'Arcy, <http://classics.mit.edu/Aristotle/history_anim.8.viii.html/> (accessed 17.09.14.).

Aristotle, 350 BCc. On the Gait of Animals. Translated by Farquharson, A. S. L., <http://classics.mit.edu/Aristotle/gait_anim.html/> (accessed 17.09.14.).

Arnott, M., Beavan, I., (n.d.): What is a Bestiary? 1a. The Origin of the Text. <http://www.abdn.ac.uk/bestiary/what.hti#origin/> (accessed 17.09.14.).

Beckhöfer-Fialho, A., 1996. Medieval Bestiaries and the Birth of Zoology. The medieval bestiary. <http://www.antlionpit.com/aura.html#bestiary/> (accessed 08.09.14.).

Druce, C.G., 1919. The Elephant in Medieval Legend and Art. Journal of the Royal Archaeological Institute 76, 1–73. <http://bestiary.ca/etexts/druce1919-2/druce1919-2htm/> (accessed 04.05.15.).

Gesner C., 1606. Thierbuch/Das ißt Außführliche beschreibung und lebendige ja auch eigentliche Contrafactur und Abmahlung aller Vierfüssigen thieren/so auss der Erden und in Wassern wohnen. Heidelberg, p. 74–79. <http://www.humi.mita.keio.ac.jp/treasures/nature/Gesnerweb/mammal/html/normal_b/l160b.html/> (accessed: 17.09.08.).

Lach Donald, F., 1994. Asia in the Making of Europe. University of Chicago Press, Chicago.

Plinius Secundus, G., 77 AD. The History of the World. The eigth Book of the History of Nature. Translated to English by Holland, Philemon, 1601. Digitized by Eason, James. <http://penelope.uchicago.edu/holland/pliny8.html/> (accessed: 17.09.14.).

Principe, L.M., 2002a. History of Science: Antiquity to 1700. TTC, Chantilly, VA, Course No. 1200, Lecture 30: Voyages of Discovery & Natural History.

Principe, L.M., 2002b. History of Science: Antiquity to 1700. TTC, Chantilly, VA, Course No. 1200, Lecture 12: The End of the Classical World.