

*Aristotle's Zoology in the Medieval World**Pieter Beullens*

In general, attitudes towards animals in the medieval Latin West were dominated by their use value. Animals served as food for the hungry, game for the huntsmen, and personal aids for the labourer or the traveler. Thomas of Chobham, a cleric from Salisbury, pointedly formulated this view in his handbook for preachers (*Summa de arte praedicandi*), written around 1220: “The Lord created different creatures with different natures not only for the sustenance of men, but also for their instruction, so that through the same creatures we may contemplate not only what may be useful to us for the body, but also what may be useful for the soul.”¹

This supremacy of man over beast found its theological substantiation in the words of the Jewish-Christian God in Genesis 1:26: “Then God said: ‘Let us make man in our image, after our likeness. Let them have dominion over the fish of the sea, the birds of the air, and the cattle, and over all the wild animals and all the creatures that crawl on the ground.’”²

As for animals in literature, the fable was arguably the only literary genre surviving from antiquity and dealing with animals that made a significant impact on the medieval mind. In fables animal behavior was used as a simile for human virtues and vices.³ It could thus be considered as “useful for the soul.”

The existence of at least three manuscripts dating from as early as the ninth century documents that Phaedrus' Latin fables in verse (first century AD) were available throughout the Middle Ages. Yet it seems that the bulk of medieval knowledge about the fables' contents derived not from the antique forerunner in the field, but was gathered from later prose adaptations. A particularly popular version was the so-called *Romulus*, an anonymous reworking from the fourth or fifth century AD based on earlier material – but many other variants circulated in Latin and in vernacular languages.⁴

The genre did more than remain mere bookish wisdom, as some fables became part and parcel of the iconography of religious and secular

architecture. In that context they were intended to be understood by both the educated and the illiterate. Animal representations based on the fables by Phaedrus and other authors can be recognized in twelfth-century sculptural works, such as the reliefs in the Porta della Pescheria of the Modena Duomo or the Portail de Saint-Ursin in Bourges.⁵ Questions regarding the relation between the buildings and their decoration have been an important issue in the scholarly debate.⁶

Similar questions could be raised regarding the occurrence of embroidered representations of eight different fables in the borders of the famous Bayeux Tapestry, which was most probably made shortly after the Battle of Hastings in 1066. Whether one agrees with the argument that fables about deceit, such as “The Fox and the Crow” or “The Wolf and the Crane,” provided negative examples for chivalry and knightly behavior, the main iconographical theme of the tapestry, clearly their presence transcends a merely decorative function.⁷ As in literature, animals in iconography fulfill their utilitarian role as foreseen by the divine plan.

Early in the new millennium an innovative literary genre started its rise. It displayed a comparable awareness that animals may usefully convey implicit or explicit messages. The intention of this kind of literature is plainly expressed by the French author Pierre of Beauvais in the preface to the so-called short version of his *Bestiary*, which eventually would become the name for most works in this genre: “Here begins the book which is called the bestiary, and it is named so because it speaks of the natures of beasts, for all the creatures which God created on this earth, he created so that they be examples of faith and belief for men.”⁸ Pierre’s work certainly deals with animals and their conduct, but they are not considered from a scientific point of view or as study objects in their own right. On the contrary, animal behavior is only deemed interesting as far as it provides suitable material for comparison with the envisioned religious conduct of humans.

Pierre established his French text on the basis of the Latin version of a work known under the title of *Physiologus*.⁹ Its Greek model probably originated in Egypt in the second or third century AD, although the exact date is debated. Translations into Latin and numerous ancient and medieval vernacular languages had contributed to its popularity throughout the known world.¹⁰ Although the work bears in some manuscripts an attribution to famous authors, the most influential being John Chrysostom, it mostly circulated anonymously. Its title was derived from the recurring phrase “The *physiologus* says ...” that introduces almost every chapter of the text. The content is a curious mixture of biblical references to animals

and of information from ancient zoological works and traditional animal lore, combined in various degrees of scientific reliability. The informative part then gets a supplement in the form of an allegorical section. Here the reader is guided toward the deeper meaning of the animal behavior, which leads to an accurate interpretation of relevant biblical passages.

The deer can conveniently act as an example to illustrate the compiler's method. When a deer discovers a dragon, it drinks water from a source and spits it into the dragon's lair, driving the dragon out and murdering it. The dragon symbolizes the devil, which is killed by the word of God. Some religious references in the story are obvious, like the allusion to the deer longing for water from the opening line of Psalm 42:2 and the water as an image for baptism. But at the same time ancient secular literature is not far away, since the alleged hatred between deer and snake is reported by Pliny (first century AD) among others. The way in which the snake from the original source changed into a dragon is an interesting example "to show how the author of *Physiologus* has reshaped the traditional material of his analogues to conform to a pre-conceived allegory."¹¹

There appears not to have been an authoritative version behind the manuscripts that transmit the text. Therefore, its order and composition display considerable variation. As a result, multiple forms of the *Physiologus* came into circulation: at least three different layers were uncovered in the transmission of the Greek version alone.¹² The instability of the text and the frequent reordering of its content led to the point that revisions of the original work could no longer be labelled as copies of the *Physiologus*. From the early twelfth century onward they rather became new products on their own. The reworking of the original layer of material could go in different directions. Either the data remained in the new output, or parts of it were excised, and in addition information from other literary sources could be incorporated. Such manuscripts became commonly known under the conventional designation of bestiary. Virtually no physical copy belonging to the genre is completely identical to another, and it has proven extremely difficult to impose even a superficial classification on the extant body of manuscripts. The organization into families and subfamilies as proposed by James and McCulloch in the previous century formed the basis of a system of division that is still in general use – albeit with minor corrections and adjustments, especially to extend the classification of Latin manuscripts to include the variety of vernacular versions.¹³

In the physical appearance of bestiaries text and image went hand in hand.¹⁴ Some of these books were so lavishly illustrated that they still form the highlights of the libraries where they are housed. For their owners

they must have served as showpieces by which they would astonish their visitors. Apart from the obvious display of wealth, their edifying content bore testimony to the moral and religious righteousness of the manuscripts' patrons. The stories contained in those books and the representations of their contents became so well known that some of them are ubiquitous in later medieval religious iconography. A standard example is the image of the pelican tearing open its breast to revive its dead chicks, which served as a powerful reference for the medieval viewer to the Son of God who shed his blood to grant his followers eternal life.

If this was the customary approach to animal behavior and only meaningful observations – genuine or fictional – were mentioned in view of their symbolical or allegorical meaning, it was highly unlikely that animals as irrational beings were to form the subject of scientific investigation in their own right. As a result, the major zoological treatises of antiquity were all but ignored in the Middle Ages. The *Physiologus* and the various forms of bestiaries display undeniable similarities to material drawn from ancient sources, in particular the commentaries on the six days of creation in Genesis by church fathers such as Ambrose and Basil (fourth century AD), as well as encyclopaedic works from later antiquity, represented by Solinus' *De mirabilibus mundi* (third century AD) and Isidore of Seville's *Etymologiae* (seventh century AD). These authors mainly compiled information they excerpted from other sources with a pronounced preference for the wonderful and the marvellous aspects that they found in the books they read. Although these works only partially deal with zoological topics, their impact can be measured by the sheer wealth of medieval manuscripts, complete and fragmentary, that survive. In the case of Isidore's *Etymologiae*, the number of extant copies, from the period between the seventh and the sixteenth centuries, must be estimated at well over a thousand.¹⁵

Solinus' and Isidore's ultimate resource was Pliny's *Naturalis historia* (first century AD), in particular books 8–11 (about land animals, *terrestria*, water animals, *aquatilia*, birds, insects, and other small animals) and 28–32 (about medicinal use of animals and animal products) of his gigantic encyclopaedia. Although Pliny was already in use as an authority to create a reliable calendar since the Carolingian age, the zoological sections of his work received much less attention throughout the Middle Ages.¹⁶ Still he had established some implicit epistemological premises that were taken for granted by the following generations. First of all, Pliny gathered his data in the library from written sources. Information from empirical observation was not considered to be superior in value – at least it is not very prominently present in his account. The purpose of his *Naturalis historia* was to

collect the knowledge as it was documented by previous writers in a report as exhaustive as achievable, and to expose its natural order.

Pliny aimed to reveal the innate structure of reality through the organization of his work. Information about animals was arranged according to large groups, based on their biotope (land, water, air). In the early thirteenth century, Alexander Neckam considered this arrangement as a clear reference to the idea that nature contained an intrinsic order according to the four elements.¹⁷ Within these classes Pliny displayed the information about the single species in a seemingly random order. Each section then explicitly stresses the specific characteristics of each animal, and in particular those elements that could be considered as something marvellous (*mirabile*), without attempting to look for resemblances in the behavior or the appearance of other species. Consequently, it would be pointless to assume the anachronistic concept of taxonomy in Pliny's work.

As far as this characteristic approach of zoological knowledge is concerned, Pliny's encyclopaedia was perfectly compatible with the organizational principles of the *Physiologus* and the bestiary that originated from it. Pliny's preference for the exceptional almost perfectly corresponded with the standards of the genre. As a result, excerpts from his encyclopaedia were eagerly incorporated into the existing bestiary texts, although Pliny was not always acknowledged as their source.

On balance, the corpus of literary texts concerning zoology and animal behavior remained largely unchanged for nearly a millennium. The single most important new input, on both a quantitative and a qualitative level, came early in the thirteenth century with the arrival of Aristotle's biological treatises in the medieval West in the form of new Latin translations.

Obviously Aristotle had been an authority throughout the Middle Ages. The Latin translations made by Boethius in the early sixth century, as well as his commentaries and original works based on them, had established Aristotelian logic as the foundation of every form of higher education. In the twelfth century, new texts by the same philosopher had surfaced. They included more treatises from the field of logic, but also opened fresh views on Aristotle's thoughts about natural philosophy, metaphysics, and ethics – areas of research in which his ideas were previously unknown in the medieval world.

These translations arrived in two distinct waves. An important group of Latin versions was not based on the original Greek text, but on an intermediate Arabic rendering. Several of these translations were accompanied by commentaries and other treatises written by philosophers from the Arab world, both contemporary and from earlier periods. An enormous

amount of translation work from the Arabic was shouldered by Gerard of Cremona, who was active in Toledo for most of the second half of the twelfth century.

Almost simultaneously other translators like James of Venice and Burgundio of Pisa brought Aristotelian texts to their Latin-speaking audience through versions compiled directly from the Greek manuscripts. Some of these might have been brought from Constantinople, while others were retrieved from centers of Greek learning in Southern Italy. The intellectual movement that transferred these new translations from the various sites where they had been created to the hotspots of intellectual life can only be glimpsed at. Whether it was by an organized undertaking or due to the coinciding availability of these various texts, by the early thirteenth century the newly discovered Aristotelian treatises circulated in manuscript collections with a more or less standardized order.

Conspicuously absent from these collections were the philosopher's books on zoology. The lacuna was filled around 1220 by Michael Scot, a prolific translator in Toledo and at the court of the Hohenstaufen emperor Frederick II in Sicily. Michael made Latin versions of Aristotle's *History of Animals*, *Parts of Animals*, and *Generation of Animals*, nineteen books in all, enough to fill a sturdy handwritten codex averaging well over 100 parchment pages.¹⁸ It may well be that the sheer volume of the works had discouraged Scot's predecessors from undertaking the endeavor. Now the Latin world had Aristotle's systematic treatments of animal behavior, anatomy, and procreation at its disposal. Scot complemented this work with the translation of the shortened commentary that the Persian philosopher Ibn Sīnā, or Avicenna, had written on these treatises in the eleventh century, which became known in the West as *Abbreviatio Avicenne*.

Although Aristotle's works circulated as separate entities in the Greek manuscripts of the time, Scot found only one long work divided in nineteen books in his Arabic model and transferred it in the same form to Latin. Consequently, references to Aristotle's zoological works consistently refer to them as *De animalibus* without distinguishing the different works. The order imposed by the ninth-century Arabic translator, or by the copyist of the manuscript that he used as a model, became the standard sequence to read the report of the philosopher's biological enterprise from the thirteenth century onwards.

That situation hardly changed when by the mid-thirteenth century the same texts were translated again into Latin, this time directly from their Greek models. The undertaking formed part of an even larger project, conducted by the Dominican scholar William of Moerbeke, to make all

of Aristotle's works available in a Latin version based on the texts in their original language. His renderings were generally considered more adequate than Scot's and closer to the wording of the initial text. Moreover, William's corpus of translations was undeniably more complete, as it also included two shorter treatises about the *Movement of Animals* and the *Progression of Animals*, bringing the total of Aristotelian zoological books up to twenty-one. That still did not reach the grand total of fifty books on animals that Aristotle allegedly had written, if Pliny was to be believed.¹⁹

As for William of Moerbeke's Latin work, there is evidence that he translated every zoological treatise as a separate work. Yet they almost exclusively circulated in an order that was dictated by the sequence in which the books had been introduced to the Latin Middle Ages through the Arabic-Latin version by Scot. Virtually every manuscript of William's texts has the works in an identical order, the two newest and relatively short books, *Movement of Animals* and *Progression of Animals*, being wedged in between the longer *History of Animals* and *Parts of Animals*.

This seemingly unimportant circumstance in the transmission of Aristotle's zoological corpus betrays how the educational system had established a firm grasp on the circulation of texts, as books were standardized to comply with the requirements of teaching. The Dominicans, the religious order to which William of Moerbeke belonged, had stimulated a new and more efficient method to multiply handwritten books in university circles, which led to more uniformity in the production. Moreover, the Dominican friars took particular care in the preparation of their books, which some of them referred to as their arms.²⁰

The professed goal of the Dominican order was to convert heretics and heathens to the truth of faith. Their working method relied on preaching. Unlike some earlier Christians, they viewed secular knowledge from antiquity not as contrary to divine revelation, but as a useful tool to serve the higher goal of spreading and illustrating God's word. Creating an access to this newly available information, including the zoological knowledge in the Aristotelian corpus, was seen as a collective endeavor in which many members of the order could cooperate. Different methods were applied, but all contributed to the comprehensive project – the integration of science from antiquity to fit religious revelation.²¹

Previously it was inconceivable to think of nature as an independent force. Even church fathers such as Augustine (fourth century AD), influenced by the Neoplatonist doctrine, had regarded nature as an emanation of the divine power. As such it was intrinsically good, but could not be considered as a separate object of study. The search for causal relations

within nature would implicitly challenge God's omnipotence and free will, which could not be seen as subjected to the laws of nature. The twelfth-century view, resulting in the popularity of *Physiologus* and bestiary literature, had opened new possibilities for the study of natural objects and zoological learning by using the device of allegory.

The Dominican friars followed that line of thought. In their judgment, objections against the use of worldly knowledge were not compelling, provided that it served their purpose. While this stance was not an exclusive policy for their order, Thomas of Chobham had directed the usefulness of animals towards theology and religious learning:

For there is no creature which may not preach that the God who created it is powerful, and that the God who gave it its order and form is wise, and that the God who conserved it in being is merciful. And – speaking in a wider sense – there is no creature in which we may not contemplate some property belonging to it which may lead us to imitate God, or some property which may move us to flee from the Devil. For the whole world is full of different creatures, like a manuscript full of different letters and sentences (*or* meanings) in which we can read whatever we ought to imitate or flee from.²²

The idea that nature could conveniently show the path toward a better understanding of God may have taken root in broader circles, but no individual or organization put it more effectively and systematically into practice than the Dominicans did. The effort to spread knowledge of nature among their brethren and to digest it into useful tools for teaching and preaching took different forms, but almost always relied on organized collaboration. It became a commonplace among authors from the friars' ranks to stress in their prefaces that they had been begged by their brethren to compose their works, which was a variation on a conventional statement of modesty. Albert the Great voiced the incentive he got from his fellow Dominicans in several prefaces to his commentaries, in particular in his prologue to his work on Aristotle's *Physics*:

It is our intention in natural science to satisfy as far as we are capable the brethren of our order. They have already asked us several years ago that we write such a book about the *Physics*, in which they would both have perfect instruction in natural science and from which they could also expertly understand the books of Aristotle.²³

Some writers expressly added to this claim that they had been greatly helped by the joint efforts of these same brethren to compile and prepare the sources and the material, and did not summarize all original books themselves. Vincent of Beauvais said this about the books by Aristotle,

“which in fact I have never excerpted from, but took the excerpts from several brothers.”²⁴

Evidence thus suggests that the study of animals did not necessarily occupy a fixed position in the output of this Dominican endeavor from the thirteenth century. In Thomas of Cantimpré's encyclopaedia *De natura rerum* the chapters are clearly aimed at usability for preachers. The first sections deal with the human anatomy and the soul, followed by animals and plants, to conclude with lifeless nature. For the users' convenience all quotations from ancient writers, in particular Aristotle, and from church fathers are brought together in alphabetically arranged units.

While Thomas of Cantimpré's work was limited to the natural world, his fellow Dominican and near-contemporary Vincent of Beauvais envisaged an even more encompassing project. He intended to put together a *Speculum*, a comprehensive collection of all human knowledge, including the study of nature, a history of the world from the fall of man onward, a survey of ethics and of other learning. The whole enterprise was completed after the death of the original author. Its only printed edition (not published until 1624 in Douai), is estimated to contain some six million words and was rightly compared to a “sequoia.”²⁵ The core of Vincent's work was his *Speculum naturale*, his survey of the natural world. He chose to order his material by the commonly accepted sequence of the six days of creation, which must have felt familiar enough for the preachers who would use the encyclopaedia.

Animals take yet another position in Albert the Great's major project to comment on the complete works of Aristotle. His intended readership was not in the first place the preacher preparing for the pulpit, but the advanced student training to become a member of the higher clergy. Albert stuck to the idea that nature as a whole forms a continuous line from God to the sensible world, and that its study is worthy to pursue since it points to the perfection that God provided in it. In correspondence with this view, Albert's commentaries are in the order of eternity of their subjects. God ranks highest, therefore theology is the equivalent of Aristotelian metaphysics or the study of the first principle. Then comes mathematics, dealing with the unchanging ratios of numbers. The sensible world follows at a third level, descending from the regular movements of the celestial bodies to the motion on earth through space and time. The lowest level is occupied by animated living beings and the materiality of stones and minerals.

Surprisingly, after his philosophical analysis of the animal world through a detailed commentary of Aristotle's zoological books as he had read them in Scot's Latin version, Albert returned to a more conventional approach

of animal studies and added several books of encyclopaedic knowledge in the traditional sense. Albert largely relied on the compilation gathered by Thomas of Cantimpré for this part of his work, which documents how the Dominican enterprise of divulging ancient knowledge and promoting its accessibility must have been a collective effort. Furthermore, Albert's method shows how the dividing lines were blurred between strictly scientific or philosophical discourses on animals and the deployment of zoological elements for exegetical purposes.

For most preachers though, knowledge about animal behavior served practical needs and therefore would have needed convenient instruments, like shorter collections of widely applicable quotes from the classical authors. One of these florilegia, whose anonymous compiler excerpted Aristotle's zoological works and organized the quotations under thematic headings, enjoyed a limited manuscript circulation.²⁶ Yet it was clearly conceived as a tool and had no authority as a literary work in its own right. Accordingly, there was no objection to reusing it in other forms. Several chapters from the florilegium were incorporated in a posthumously modified version of Thomas of Cantimpré's *De natura rerum*. At the same time the older sources of zoological knowledge were further exploited to collect useful quotations. One manuscript that contains the Aristotelian florilegium also holds similar anthologies from the works of Solinus and Isidore of Seville. As several other sections of the manuscript make reference to early thirteenth-century Parisian theological debates, we may safely assume that this type of thematically ordered collection of authoritative quotations belonged to the standard intellectual equipment of the theologian of the period.²⁷

Individual preachers may have developed their own working material to plan their sermons. Just what this equipment might have looked like can be reconstructed from what appears to be the notebook prepared by an English friar from the same period.²⁸ It is a small booklet written in an extremely tiny handwriting by one scribe, undoubtedly for his own use. The owner had collected a florilegium of quotations from different sources, with an emphasis on natural history. Traditional knowledge from the works of Solinus and Isidore of Seville and from the sacred scriptures is combined with lists of extracts from the newly translated works of Aristotle. The writer improved the accessibility of information by an intricate system of cross-references that link data regarding the same topic with material from different origins on separate pages of the volume. He also created diagrams that use association to divide key concepts into their logically constitutive parts.

Unfortunately, the identity of the compiler of the notebook remains unknown and it is impossible to conclude how he used the material that he had gathered. There is, however, a corpus of commentaries on the sacred scriptures by a well-known preaching friar. A closer look at these provides a general idea of how medieval preachers incorporated ancient works on animals in their exegetical practice.

In the first half of the fourteenth century, Thomas Anglicus or Thomas Waleys, another Dominican friar, wrote *moralitates* on numerous books of the Old Testament and incomplete commentaries on Augustine's *City of God* and on the psalter.²⁹ He shared his particular taste to incorporate ancient pagan writers into his exegesis with other contemporary British friars. They undeniably were indebted to the compilation work done by their predecessors.³⁰ Yet Waleys clearly had a predilection for Aristotle's zoological works, which he quoted abundantly. Most often these sentences turn up accompanied by the commentaries of Albert the Great and Avicenna, and it is not uncommon that Pliny and Solinus are mentioned as well.

Waleys' method is illustrated in passages where he introduces data about deer in his incomplete commentary on the first thirty-seven psalms.³¹ The *Physiologus* is totally absent from his list of sources, while Aristotle, Pliny, and Isidore of Seville, together with some early Christian authors, provide the necessary backdrop to authorize the letter of the Scriptures.

The first example comes from Psalm 18, where verse 34 "Who made my feet swift as a deer's" leads to the comparison of Christ to a deer. Waleys comments: "Christus is rightly compared to a deer for many reasons, first because the Philosopher says in his 14th book on Animals: A deer has no bile. The same goes for Christ, whose stay among us was without any bile of bitterness."³² Waleys finds additional arguments for the similarity between Christ and the deer in Ambrose's commentary on the Hexameron, which says that deer feed on venom (as Christ leads sinners to penitence), and in Pliny's claim that the blood of a deer is a cure against serpents (as Christ is the medicine against demons). The initial word from the Scripture that prompted the allusion is thus confirmed by arguments from ancient pagan and Christian sources.

Psalm 29, verse 9 "The voice of the Lord prepareth the stags" reminds the commentator of the previous passage in Psalm 18.³³ The voice of the Lord prepares the deer, his children in the desert, for the long and difficult road, Waleys claims. He suggests several reasons to explain the choice of that image. Deer are fast and swift to jump over difficulties and rocky roads – no reference needed to back this claim, except for the other psalm.

A further argument comes from Isidore of Seville's account of deer crossing a river with their head resting on the back of their forerunner to make the burden lighter, which recalls Paul's letter to the Galatians 6:2 "Bear one another's burdens." Finally, Aristotle is the last authority in the section: "As the Philosopher says in his 8th book on Animals: The horns of all animals are hollow except those of the deer, which are solid and have no cavity inside. Likewise, the horns of the sinners are also hollow, for all their power and glory are vain."³⁴

As these few examples from the work of Thomas Waleys show, all knowledge from the natural world was put to use to elucidate God's plan for the world. New sources from antiquity had staked their claim to authority from the thirteenth century onward and Aristotle had taken pride of place among them. Yet animals retained their serving position in all kinds of literature. It took three centuries more before humanist scholars started to consider animals as worthy study objects in their own right. The first projects consisted in exploring the ancient sources for information, descriptions and nomenclature.³⁵ Aristotle had preserved his place at the center of zoological attention – albeit in new Latin translations or in the Greek original. But the readers had turned from theologians to philologists.

Notes

- 1 D. L. d'Avray, *The Preaching of the Friars. Sermons Diffused from Paris Before 1300* (Oxford: Clarendon Press, 1985), 233.
- 2 The Bible is quoted in the translation of the New American Bible.
- 3 See Francisco Rodriguez Adrados, *History of the Graeco-Latin Fable, Volume One: Introduction and From the Origins to the Hellenistic Age* (Leiden: Brill, 1999).
- 4 See Gerd Dicke and Klaus Grubmüller, *Die Fabeln des Mittelalters und der frühen Neuzeit. Ein Katalog der deutschen Versionen und ihrer lateinischen Entsprechungen* (München: Wilhelm Fink Verlag, 1987), passim.
- 5 See Nathalie Le Luel, "L'âne, le loup, la grue et le renard: à propos de la frise des fables du tympan Saint-Ursin de Bourges," *Reinardus* 18 (2006): 53–68.
- 6 Decorations were clearly planned in advance by the patrons of the buildings. It was their choice to include the secular fables known from the educational program and to incorporate them in a religious building.
- 7 Stephen D. White, "The Fables in the Borders," in *The Bayeux Tapestry and its Contexts: A Reassessment*, ed. Elisabeth Carson Pastan, Stephen D. White, and Kate Gilbert (Woodbridge: The Boydell Press, 2014): 154–82.
- 8 Guy René Mermier, *A Medieval Book of Beasts: Pierre de Beauvais' Bestiary*. (Lewiston: Mellen, 1992), 3.
- 9 The earliest overview of the work and its history is in Friedrich Lauchert, *Geschichte des Physiologus* (Strassburg: Verlag Karl J. Trübner, 1889).

- 10 See Nikolaus Henkel, *Studien zum Physiologus im Mittelalter* (Tübingen: Niemeyer, 1976).
- 11 Michael J. Curley, *Physiologus* (Austin: University of Texas Press, 1979), xxvi.
- 12 Franciscus Sbordone, *Physiologus* (Mediolani; Genuae; Romae; Neapoli: Aedibus Societatis "Dante Alighieri – Albrighi, Segati et C.," 1936).
- 13 See M. R. James, *The Bestiary: Being A Reproduction in Full of Ms. li 4. 26 in the University Library, Cambridge, with Supplementary Plates from Other Manuscripts of English Origin, and a Preliminary Study of the Latin Bestiary as Current in England* (Oxford: Roxburghe Club, 1928); Florence McCulloch, *Mediaeval Latin and French Bestiaries* (Chapel Hill: The University of North Carolina Press, 1962).
- 14 For a study of the relation between text and image, Debra Hassig, *Medieval Bestiaries. Text, Image, Ideology* (Cambridge: Cambridge University Press, 1995).
- 15 Baudouin Van den Abeele, "La tradition manuscrite des Étymologies d'Isidore de Séville. Pour une reprise en main du dossier," *Cahiers de Recherches Médiévales et Humanistes* 16 (2008): 195–205.
- 16 Arno Borst, *Das Buch der Naturgeschichte. Plinius und seine Leser im Zeitalter des Pergaments* (Heidelberg: Universitätsverlag C. Winter, 1994).
- 17 *Ibid.*, 264.
- 18 Charles Burnett, "Michael Scot and the Transmission of Scientific Culture from Toledo to Bologna via the Court of Frederick II of Hohenstaufen," *Micrologus* 2 (1994): 101–26.
- 19 Pliny, *Naturalis historia*, VIII, 17. The thirteenth-century Franciscan scholar Roger Bacon echoed Pliny, claiming to have seen those books in Greek, see J. S. Brewer, ed., *Fr. Roger Bacon. Opera quaedam hactenus inedita* (London: Longman, Green, Longman, and Roberts, 1859), I: 473. His statement is highly unlikely, and it is far more probable that Bacon only read Aristotle's zoology in the nineteen books by Michael Scot.
- 20 K. W. Humphreys, *The Book Provisions of the Mediaeval Friars, 1215–1400* (Amsterdam: Erasmus, 1964), 18.
- 21 Roger French and Andrew Cunningham, *Before Science: The Invention of the Friars' Natural Philosophy* (Aldershot: Ashgate, 1996).
- 22 d'Avray, *The Preaching of the Friars*, 233.
- 23 Albertus Magnus, *Physica*, ed. Paulus Hossfeld (Aschendorff: Monasterii Westfalorum, 1987), I.1, tr. I, c. 1; p. 1, l. 9ff, ed.; my translation.
- 24 French and Cunningham, *Before Science*, 174.
- 25 Frits van Oostrom, *Maerlants wereld* (Amsterdam: Prometheus, 1996), 310.
- 26 Pieter Beullens, "A 13th-Century Florilegium from Aristotle's Books on Animals. Auctoritates extractae de libro Aristotilis de naturis animalium," in *Aristotle's Animals in the Middle Ages and Renaissance*, ed. Carlos Steel, Guy Guldentops, and Pieter Beullens (Leuven: Leuven University Press, 1999), 69–95.
- 27 Paris, Bibliothèque nationale de France, lat. 14726, see Young, Spencer E. "Paris, BNF, Ms. lat. 14726: Peter of Bar, Stephen Berout and Master G. A New Witness to William of Auxerre?" *Bulletin de Philosophie Médiévale* 50 (2008): 53–82.

- 28 Rare Book and Manuscript Library University of Pennsylvania LJS 477, see Crofton Black, *Transformation of Knowledge. Early Manuscripts from the Collection of Lawrence J. Schoenberg* (London: Paul Holberton, 2006), 136. The description of the manuscript here is partly based on an autopsy of the manuscript in August 2005 in Paris by kind permission of Lawrence Schoenberg, who had just acquired it.
- 29 Beryl Smalley, "Thomas Waleys O.P.," *Archivum Fratrum Praedicatorum* 24 (1954): 50–107.
- 30 *Ibid.*, 79, refers to the *tabulae* of the Fathers as an example.
- 31 Manuscripts and editions are listed in Smalley, "Thomas Waleys O.P.," 67–9, and Fridericus Stegmüller, *Repertorium Biblicum Medii aevi* (Madrid: Instituto "Francisco Suárez," 1955), 5: 395. Quotations from the commentary are taken from ms Troyes 1086 (online version www.bibliotheque-virtuelle-clairvaux.com/manuscrits/), checked against the London 1481 edition by John Lettou for William Wilcock as reproduced in the database *Early English Books Online* from the copy in the Bodleian Library, Oxford. The pages of this edition are not numbered.
- 32 *Assimilat se Christus cervo in proposito propter multa, primo quia dicit Philosophus 14. de Animal. Cervus fel non habet. Sic et Christus cuius conversatio nobiscum fuit absque omni felle amaritudinis* (Ms Troyes 1086, f. 76v).
- 33 The translation is from the Douay-Rheims Bible, which renders the text from the Vulgate ("Vox Domini preparantis cervos") that Waleys had in front of him.
- 34 *Sicut dicit Philosophus 8. de Animal. Omnium animalium cornua sunt vacua preterquam cervi, que sunt dura et non est concavitas in eis. Sic et peccatorum cornua vacua sunt, quia omnis eorum potentia et gloria inanis est* (Ms Troyes 1086, f. 136r).
- 35 Pieter Beullens, "Aristotle, his Translators, and the Formation of Ichthyologic Nomenclature," in *Science Translated: Latin and Vernacular Translations of Scientific Treatises in Medieval Europe*, ed. Michèle Goyens, Pieter De Leemans and An Smets (Leuven: Leuven University Press, 2008), 105–22.