

# MEDICAL LORE IN THE BESTIARIES\*

by

THOMAS R. FORBES

SOME time in the first part of the Christian era, perhaps as early as the second century, there emerged a curious collection of zoological fables and religious moralizations called *Physiologus*.<sup>65</sup> It may have begun as a group of tales about animals and their attributes. The number of different creatures originally was about forty.<sup>6,37</sup> The *Physiologus* was copied repeatedly and, in time, was greatly expanded, clerical compilers adding to the moralizations, which became more and more elaborate—and lengthy. Because such a manuscript was a kind of ‘book of beasts’, it acquired the name *bestiarium* or bestiary. Physicians took a hand with it, which was not surprising, since in the Middle Ages educated medical men were also clerics.<sup>57</sup> They were familiar with the ideas of Pliny, Solinus, Placitus Sextus, Isidore, and others about animals, their habits, and the supposed virtues of animal preparations in medicine. As a result, some of the special curative powers described by classical authors were gradually attributed to certain of the bestiary animals.\*\* Finally the moralizations disappeared from the bestiaries and there was left a welter of fact and fiction, hearsay and imagination, about a whole zoological garden of real and supposed creatures ranging from ants to dragons to elephants, as well as about healing plants and stones. From all this eventually emerged, thanks to the labours of indefatigable if credulous encyclopedists, the first zoology books since the classical period. Such, for example, were the *De animalibus* of Albertus Magnus in the thirteenth century, the *Buch der Natur* of Conrad von Megenberg in the fourteenth century, and Conrad Gesner’s *Historiae animalium* in the sixteenth century.<sup>1,25,49</sup>

Authorities agree that the bestiaries were widely read. The original Greek *Physiologus* is lost, but its earliest descendants, a sturdy progeny, exist today in manuscripts in Greek, Latin, Armenian, Syriac, Ethiopic, Georgic, and Arabic, most of these versions and translations having been made by the fifth century.<sup>15</sup> The Syriac may be the oldest which now survives.<sup>36</sup> In the Middle Ages there appeared versions in Saxon, Old English, Old High German, Middle High German, Icelandic, Anglo-Norman, French, Romance and Provençale dialects, Italian, and Spanish. It has been estimated that the popularity of the bestiary may have been second only to that of the Bible.<sup>3,6,21,35</sup> James suggests that the bestiary pictures, crude though they were, were chiefly responsible for its great appeal. As he says, such a work could make small claims on a literary or scientific basis.<sup>37</sup> Nevertheless, the simple tales of animals and their strange attributes have a certain charm. That the beasts and birds and reptiles were much in educated as well as popular minds is evident when one observes the prominence of these creatures in medieval heraldry, architecture, art, and literary allusion (‘crocodile’s tears’, ‘lick him into shape’, ‘swan song’), as well as

\* This research was supported by a grant-in-aid from the American Council of Learned Societies and by grant LM-00019, National Library of Medicine, U.S. Public Health Service. The author is also indebted to Dr. Charles Talbot for valuable information and ideas.

\*\* But not all bestiaries, even after the early period, included medical elements. One of the exceptions was the *Physiologus* attributed to Theobald, Bishop of Monte Cassino in 1022–1035.<sup>61</sup>

their direct influence on the later encyclopedists.<sup>21</sup> The moralizations of the bestiaries recommended them to the clergy, who found here simple anecdotes and allegories to support much learned exegesis.<sup>6,10,14,21,35,36,37,61,62,63,64</sup> Even the unsophisticated churchgoer, overwhelmed by a sermon inspired by a bestiary tale, could seek relief by gazing up at a unicorn in the stained glass window or resting his head against a lion carved on the end of the pew.

Any extensive study of bestiaries is likely to be complicated by their intricate and tangled family tree. The line of descent of a particular manuscript may be as important as it is difficult. The careful studies of many scholars, for example those of Carmody, Ives and Lehmann-Haupt, James, and McCulloch, have been of great help in the investigation which is to be reported.<sup>11,35,37,44</sup>

Curiously enough, relatively little attention seems to have been given to one aspect of the bestiary, its content of crude medical lore, although the important studies of Dr. Beatrice White disclosed a rich field.<sup>62,63</sup> My concern is with medical elements in the bestiaries proper, excluding the related but separate compilations of traditional remedies ascribed to, or written by, St. Hildegard of Bingen,<sup>31,54</sup> Alexander Neckam,<sup>66</sup> Johannes Cuba,<sup>6,32</sup> and others. If one concedes its broad influence in the realms of art and literature, it seems safe to assume that the bestiary may also have been an influential element in popular medicine.

#### CARADRIUS

Possibly the best known inhabitant of the bestiary was the *caradrius*.<sup>\*</sup> Its legend goes back at least to Pliny and Aelian.<sup>41</sup> The earliest mention of the *caradrius* which I have found in a bestiary is in the *Physiologus* attributed, probably incorrectly, to Bishop Epiphanius of Cyprus (c. 315–402). His version was printed in the sixteenth century by Ponce de Leon, Vicar General of the Augustinian friars. In a later version, edited by Pitra,<sup>10,20,21</sup> the passage about this bird says, in translation:

There is a bird called the *caradrius* which *Physiologus* says is completely white, with absolutely no trace of black. Then if some one suffers from illness, and his malady is fatal, the *caradrius* turns away his face. However, if the disease permits recovery, then the *caradrius* turns his gaze toward the sick man, and he likewise toward the *caradrius* [Fig. 1].

A Latin *Physiologus* ascribed to one Theobald dates from the eighth or ninth century (Berne, Pub. Lib. 233). Its text is almost identical with that of another Latin version of the late tenth century (Brussels, Roy. Lib. 10,074).<sup>8,12,56</sup> By now, the account of the bird was more detailed:

Item, there is a bird called *caradrius*. Of this it is written in Deuteronomy, [14:18], Thou shalt not eat the *caradrius*. *Physiologus* says that is entirely white, having no black part; its excrement cures a mist before the eyes, [*caliginem oculorum*].<sup>\*\*</sup> It is found in the courts of kings. Moreover, if anyone is ill, it can be determined from this *caradrius* whether he [the patient] will live or die.

\* Also *charadrius*, *charatrius*, *caladrius*. The terms apparently identified a kind of plover, and the modern family *Charadriidae* includes the plovers. *Caladrius* was sometimes confused with *calandrius*, which was quite another bird.<sup>36,46</sup> Pliny (XXX, 94) probably referred to the *caradrius* when he spoke of the *icterus*, a yellow plover thought to cure jaundice.<sup>58</sup> Lewis and Short say that *charadrius* was 'a yellowish bird'.<sup>43</sup>

\*\* It has been suggested that the classical and medieval use of the excrement of birds and reptiles in various prescriptions may have been due to the ammonia which is released. Its sharp odour and alkaline quality may have had some real as well as imagined effects.

### Medical Lore in the Bestiaries

If the man's illness is mortal, the *caradrius* will turn away his face as soon as he sees the sick person, and all know that the man will die. If, however, his illness is not fatal, the *caradrius* looks him in the face and draws into himself all of the man's sickness, and he [the bird] flies into the air toward the sun, and it consumes his sickness and disperses it, and the sick man becomes well.

The action of the bird in taking the disease into itself (some later versions say, 'breathes in') seems to exemplify the ancient belief in cures by magical transference of disease from the patient to an animal or inanimate object. It was widely held in antiquity that jaundice could be transferred to the *caradrius*.<sup>23,44</sup>

In one bestiary of the eleventh century the description of the *caradrius* was similar to that here translated.<sup>29</sup> In another,<sup>33</sup> the remedy for mistiness of the eyes is not *cujus interior finnis*, as in the above passage, but *cujus femoris pars interior*—the inside of its thigh or, better, the marrow of its thigh bone.\* Very likely this was a copyist's error.<sup>44</sup> The phrase provides the only significant difference in many other versions of the story. *Excrement* was the term used in early Armenian<sup>9</sup> and Greek<sup>48</sup> versions and in several ninth-,<sup>13</sup> twelfth-,<sup>36,43,63</sup> and thirteenth-century<sup>17,18,19</sup> bestiaries. In the *Speculum naturale* (not a bestiary) of Vincent of Beauvais (1190?–1264?), both terms are used.<sup>60</sup> *Marrow from the thigh bone*, however, is the meaning of the phrase as it appears in other bestiaries<sup>5,40,43,61</sup> of the twelfth to fifteenth centuries. Sometimes there was no reference to a remedy for the eyes.<sup>27,30,45,52</sup>

The idea that the *caradrius* could heal with its gaze may have been related to the belief that diseases of the eye could be cured with other parts of the bird. Presumably it was thought to turn away from one fatally ill because it could not, or would not, make use of its healing glance. It is interesting that *Li livres dou Tresor*, a compilation (but not a bestiary) by the thirteenth-century author Brunetto, states that the *lungs* of the *caradrius* will heal the eyes. He continues, 'There are people who say that it inhales [*aspire*] the illness while looking at the sick people and carries them [the diseases] into the celestial region of fire where the evil forces are consumed.'<sup>40</sup>

The implication seems to be that if the lungs can safely transport disease, then the lungs can heal the eyes, a curious extension of the original superstition.

#### CASTOR

The beaver, *castor*, was a regular denizen of the pages of the bestiary (Fig. 2). The stories about him in several eighth- to tenth-century versions are nearly the same.

There is an animal called *castor*, excessively gentle, whose testes are useful as a remedy in various illnesses. *Physiologus* explains its [the beaver's] nature by saying that when the hunter shall have found its tracks, he follows in pursuit. The beaver, when he looks back and sees the hunter coming after it, at once tears off its testes with one bite and casts them before the hunter and fleeing thus, escapes. The hunter advancing, however, gathers them up, and pursues no further, but retires. If, on the other hand, [the beaver] ventures forth again so that another hunter, searching eagerly, should come upon and pursue it, [the animal,] seeing that it cannot escape, rears upright and reveals its genitals to the hunter. The latter, observing that it has no testes, departs from it.<sup>8,9,12,13,46</sup>

Bestiaries in the eleventh to fifteenth centuries told this legend with little or no addition.<sup>5,19,26,29,30,36,40,45,52,61,64</sup>

\* Medieval medical books had many remedies for eye diseases. Bone marrow would obviously make a good base for a salve.

Bishop Isidore, a seventh-century etymologist whose imagination sometimes exceeded his scholarship, suggested that *castor* comes from *castro*, castrate (*Castores a castrando dicti sunt*).<sup>84,87,88</sup> While this hypothesis is untenable, the notion that the beaver castrates himself may well have been based on mistaken observations made by hunters. The external genitalia of male and female beavers are identical in appearance. Both sexes have a cloaca into which *castoreum* glands, anus, and urethra open and concealed in which are the penis or the aperture of the vagina. In addition, the testes are hidden in inguinal canals, and there is no scrotum.<sup>16,50,64</sup> The large scent glands, present in both sexes, lie on either side of the midline between the anus and external genitalia and may readily be mistaken for testes.<sup>16,64</sup> Thus casual inspection of a beaver could be misleading. Even the upright posture mentioned in the bestiary actually is not uncommon in this animal when it looks about for approaching enemies. Castor, *castoreum*, or beaver musk is a thick, oily, brownish secretion of the perineal scent glands, was once used in medicine, and may still be a base for perfume. This was one reason why hunters pursued the unfortunate beast.

#### STAG

A fifteenth-century Latin bestiary,<sup>37</sup> delightfully translated and annotated by T. H. White,<sup>64</sup> tells of the curative powers of the stag's antlers, particularly the right one. Burning the horn (thereby producing ammonia) drives away snakes.\* The rennet of the unborn fawn is an antidote for poison, and the marrow of stags reduces fevers.

I have not found mention of remedies from stags in other bestiaries.

#### DOG

Intestinal wounds may be treated with a salve prepared from a puppy's tongue.<sup>64</sup>

#### ELEPHANT AND MANDRAKE

A Latin bestiary of the eighth or ninth century told a tale of the elephant, 'great in intellect but feeble in desire to reproduce'. The cure was for him and his mate to travel eastward until, near paradise, they found the plant called mandrake. Like Eve, the female elephant first tasted its fruit and then persuaded her mate to partake. Soon after, she conceived.<sup>11</sup> Although this story is interesting because of its obvious Biblical parallel, it has no medical component. However, it is reported that the fumes of burning elephant skin and bones would drive out serpents and other poisonous reptiles, as indeed they might! Once again there is more than a whiff of ammonia.

About 1125 Philippe de Thaün wrote a bestiary in rhymed verse. This work, a translation of the *Physiologus* into Anglo-Norman, was dedicated to Aélis de Louvain, wife of Henry I.<sup>39,40,43,47,61</sup> It referred to the great medicinal power of the mandrake root, a sovereign remedy for everything except death. (The root, forked, somewhat resembled a human figure, and was the centre of widespread superstitions.) The female mandrake root provided a remedy for women.<sup>40,44,61</sup> Several other twelfth- and thirteenth-century versions stated that mandrake in wine produced a deep sleep which would prevent the pain of surgery, while a decoction helped many illnesses.<sup>44</sup> The

\* Hartshorn (*sal volatile*) is an old fashioned name for a remedy which releases ammonia.



Figure 1  
 The caradrius gazes encouragingly at a patient.



Figure 2  
 A hunter confronts a beaver, an experience evidently not shared by the artist.  
 The illustrations are from a fifteenth-century Latin bestiary (Gg. 6.5) in the University Library,  
 Cambridge, England.

### *Medical Lore in the Bestiaries*

bruised plant would stop pain if applied locally, and a drink made from it would induce pleasant analgesic slumber.<sup>19</sup>

Many of these details also appeared in a Norman-French rhyming bestiary written about 1210 by Guillaume le Clerc, or Guillaume le Normand. His version was based on another, in Latin, attributed to Hugo of St. Victor (c. 1078–1141).<sup>19,40,44,61</sup> The latter, theologian, philosopher, and mystic, is thought to have been born in Saxony but lived in Marseilles and Paris.<sup>4,28</sup>

One is tempted to digress on the subject of the mandrake, about which a great deal has been written. Perhaps it is enough here to say that both Celsus and Galen employed it in an ointment for eye conditions, that it contains atropine or an atropine-like alkaloid, and that it is indeed a sedative and hypnotic.<sup>38,56</sup>

#### CURATIVE STONES

Cahier translated into French the text of an Armenian bestiary. He does not identify the latter clearly, but it evidently was relatively early. One passage is as follows:

There is a bird called the vulture. It lives either at the summits of high mountains, or near the source of torrents, or again in deep caves. When the fancy takes it, it journeys to India and finds a stone which has the power to make egg laying easy. This stone is shaped like a nut; when shaken, a kind of stone inside is rattled, making a variety of tinkling sound. The bird puts the stone on itself when it feels the first pains and lays its egg without suffering.<sup>9</sup>

The Ethiopian version<sup>30</sup> and a ninth-century Latin version<sup>13</sup> were very similar except that they actually described the female vulture as pregnant and told how the stone prevented a difficult birth. An early Greek version used the name birth stone, and said the object came from India.<sup>48</sup> Although the bird is not identified in these versions, it is clear that the legend is simply a variation of the widely spread eagle stone story. The eagle stone, or *aetites*, has a long history as a protective charm in human pregnancy and in childbirth.<sup>22</sup> Like the vulture stone, the *aetites* rattles when it is shaken.

A stone often, but not always, identified as the *lapis Indicus* appears in several bestiaries as a cure for dropsy. For example, the late tenth-century Brussels manuscript (Royal Lib., 10,074) reports:

The *lapis indicus* [*sic*] has this nature: if someone is dropsical, the apothecaries [*artifices medicorum*] ask for the stone. If they obtain it, they bind it to the dropsical persons, and they hang the stone on the man, and a moderate sized stone draws out [fluid] equal on the balance to the weight of the body of the man. If, thereupon, the stone is put out in the sun for three hours, it discharges the stinking fluid which it has taken from the man's body, so that the stone is purified.<sup>9</sup>

The story in the Greek *Physiologus*,<sup>48</sup> in the eighth- and ninth-century Berne manuscripts (MSS. 233, 318, 611),<sup>13,44,56</sup> and in the Ethiopian *Physiologus*<sup>30</sup> are nearly identical with that above. No one comments on the practical difficulty in extracting from a patient an amount of fluid equal in weight to that of his body!

With a poet's grace Philippe de Thaün writes in his twelfth-century bestiary of other stones. Flawless and filled with the rosy hue of heaven, they reproduce like

living creatures. Shells at the surface of the sea, he says, absorb the glow of sunrise, then sink to the ocean's floor and are transformed into jewels which are a universal panacea.<sup>40</sup> Guillaume le Clerc may have been thinking of the same jewel when he told of the diamond which is an antidote against poison and a shield against enchantment.<sup>19</sup>

#### REMEDIES FOR ANIMAL AILMENTS

In addition to the Indian stone which allays the 'birth' pains of the vulture, the bestiaries tell us of a number of other remedies which are curative or restorative for animals. The work perhaps written by Basil the Great (A.D. 330?-379?), Bishop of Caesarea, relates that the bear applies the root *pholmis* to his wounds and sores so that they will be healed by its astringent action. The fox uses *biturea*, a resin, for the same purpose. When poisoned by eating the flesh of the viper the turtle gains relief by consuming the root of *origanum*.<sup>10</sup>

Snakes, the same source continues, eat fennel to cure painful and blind eyes. The eighth- or ninth-century bestiary carefully analysed by Carmody<sup>12</sup> describes other therapy for failing vision: 'There is a swift creature called *lacerta*, shining as the sun. *Physiologus* says of it that when it becomes old it is hindered by failing vision so that it cannot see the sunlight. But it has at hand a remedy of this kind: [the lizard] seeks out a wall facing against the east and crawls out through an opening, and its vision is restored.'<sup>12, 64</sup>

Once again we can guess at some basis in fact for this legend. Lizards periodically shed their 'skins' (actually, not the whole skin but only part of the epidermis). Some lizards either have a transparent area in the lower eyelid, or both lids are permanently joined and are transparent. Either way, the eye itself is protected from abrasion.<sup>7</sup> When the epidermis separates prior to sloughing it becomes almost opaque. Presumably, such a layer over the eyelid obscures vision until the dead tissue is rubbed or pulled off, as by crawling through stony apertures.

The eagle had eye troubles too. His cure was first to fly toward the sun, then to plunge three times into a fountain of pure water, an act obviously symbolic of baptism. Thus his sight and his youth were renewed.<sup>55</sup>

The weasel could restore life to its dead young ones, as could the pelican, and the kindly hoopoe bird, troubled to see its parents growing old, preened them and cleansed their eyes.<sup>64</sup>

#### BOOKS OF ANIMAL REMEDIES

Compilations, usually quite distinct from the bestiaries, of remedies derived from animals have existed since classical days, as indicated earlier in this paper. The pattern established by the time of Pliny, if not earlier, was continued by Placitus Sextus, St. Hildegard of Bingen, Albertus Magnus, and several others. The collections of remedies became very extensive by the sixteenth century, as witness the books of Aldrovandus<sup>2</sup> and Ursinus.<sup>59</sup> Sometimes such compilations included medicines obtained from plants as well as animals, as in Gesner's *The Newe Iewell of Health*.<sup>24</sup> William Salmon's *Pharmacopoeia Londinensis* for 1696 includes remedies derived from 68 'beasts' (not all of them mammals), 77 birds, 96 fish, and 24 snakes!<sup>54, 58</sup> Usually

### *Medical Lore in the Bestiaries*

each creature mentioned was said to supply several different medicines. But by this time, of course, beast books in the original sense were no longer being written.\*

We must see the bestiary as a progressively specialized composition that began in the fifth century or earlier with the almost legendary *Physiologus* and that eventually, probably by the end of the sixteenth century, had ceased to be produced. But for a thousand years or more it held sway as the prognostic gaze of the *caradrius* and the saving power of the mandrake played their parts in the medical lore of the Middle Ages.

\* An anonymous fifteenth-century Latin bestiary at the University of Cambridge (Figs. 1, 2) carries on its 'flyleaf' the doodling of a previous owner as well as his announcement that 'hic liber est meus/possum producere testem/ si qui me querit georgius/ gulillmus [sic] nomen erit'. (This book is mine; I can produce a witness. If someone asks for me, the name will be George William.)<sup>6</sup>

### REFERENCES

1. ALBERTUS MAGNUS, *De animalibus*, Münster i. W., Aschendorff, 1916–21.
2. ALDROVANDUS, ULYSSIS, *De quadrupedib. digitatis viviparis*, Bonon., Nicolaus Tebaldinus, 1645.
3. ALLEN, J. R., *Early Christian Symbolism*, London, Whiting, 1887, pp. 335–40.
4. A[LPHANDÉRY], P. [D.] HUGH OF ST. VICTOR. In: *Encyclopaedia Britannica*, New York, 1910, 13, 859.
5. ANONYMOUS, Latin M.S., Cambridge University Library, Gg.6.5. 15th century.
6. ANONYMOUS, *The Animal Kingdom*, New York, 1940, p. 10.
7. BELLAIRS, ANGUS, and CARRINGTON, RICHARD, *The World of Reptiles*, New York, American Elsevier, 1966, pp. 64–65.
8. CAHIER, CHARLES, 'Le Physiologus ou bestiaire', in: CAHIER, CHARLES, and MARTIN, ARTHUR, *Mélanges d'Archéologie*, Paris, Poussielgue-Rusand, 1851–56; 2, 85–100, 106–232; 3, 203–88; 4, 55–87.
9. *Idem.*, *Nouveaux mélanges d'Archéologie*, Paris, Firmin Didot, 1874, 1, 120, 129, 132.
10. CARLILL, JAMES (trans.), 'Physiologus', in: ROSE, WILLIAM. *The Epic of the Beast*, London, George Routledge, 1924, pp. 157, 158, 178, 195, 210, 225, 247.
11. CARMODY, F. J., 'De bestiis et aliis rebus and the Latin Physiologus', *Speculum*, 1938, 13, 153–59.
12. *Idem.*, 'Physiologus Latinus', *Éditions préliminaires versio B*. Paris, E. Droz, 1939, pp. 7–10, 15, 32, 60.
13. *Idem.*, 'Physiologus Latinus versio Y', *Univ. Calif. Publicns. Class. Philol.*, 1941, 12, 95–134.
14. *Idem.*, *Physiologus*, San Francisco, The Book Club, 1953.
15. COOK, A. S., *The Old English Elene, Phoenix, and Physiologus*, New Haven, Yale University Press, 1919, p. lvii.
16. CRANDALL, L. S., *The Management of Wild Mammals in Captivity*, Chicago, University of Chicago Press, 1964, p. 227.
17. DRUCE, G. C., 'The caladrius and its legend, sculptured upon the twelfth-century doorway of Alne Church, Yorkshire', *Archaeol. J.*, 1912, 69, 381–416.
18. *Idem.*, 'The mediaeval bestiaries and their influence on ecclesiastical decorative art', *J. Brit. Archaeol. Assoc.*, n. s., 1919–1920, 25, 41–82; 26, 35–79.
19. DRUCE, G. C. (trans.), *The Bestiary of Guillaume le Clerc*, Ashford, Kent, Headley, 1936, pp. 7, 22, 90–91.
20. EPIPHANIUS, S. P. N., 'Ad Physiologum', in MIGNE, J. P. (ed.), *Patrologiae Graecae*, Brepols, Turnholtus, [1959], col. 531.



21. EVANS, E. P., *Animal Symbolism in Ecclesiastical Architecture*, London, Heinemann, 1896, pp. 54–61, 74.
22. FORBES, T. R., *The Midwife and the Witch*, New Haven, Yale University Press, 1966, pp. 64–71.
23. FRIEDMANN, HERBERT, *The Symbolic Goldfinch*, Washington, D.C., Bollingen Foundation, 1946, p. 11.
24. GESNERUS [CONRAD], *The newe Iewell of Health*, London, Henrie Denham, 1576.
25. *Idem.*, *Historiae animalium* . . . Francofurdus, Ioannis Wechelus, 1586.
26. GOLDSTAUB, MAX, and WENDRINER, RICHARD, *Ein tosko-venezianischer Bestiarius*, Halle a. S., Max Niemeyer, 1892, pp. 293–94, 369.
27. HAM, E. B., 'The Cambrai bestiary', *Modern Philol.*, 1939, 36, 225–37.
28. HEBERMANN, C. G., et al. (eds.), 'Hugh of St. Victor', in: *The Catholic Encyclopedia*, New York, The Encyclopedia Press, 1910, 7, pp. 521–23.
29. HEIDER, GUSTAV, 'Physiologus nach einer Handschrift des XI. Jahrhunderts', *Archiv für Kunde österreichischer Geschichts-Quellen*, 1850, 4, 541–582.
30. HOMMEL, FRITZ, *Die Aethiopische Uebersetzung des Physiologus*, Leipzig, J. C. Hinrichs, 1877, pp. 48, 66, 69, 92.
31. HUBER, ALFONS, *Der Aebtissin St. Hildegardis myst. Tier- u. Artzeneyen-Buch*, Wien, Gloriette, [c.c. 1923].
32. HUDSON, NOEL (ed.), *An Early English Version of Hortus sanitatis*, London, Quaritch, 1954.
33. HUGO DE ST. VICTOR, 'De bestiis et aliis rebus', in: MIGNE, J. P. (ed.), *Patrologiae . . . Series Latina*, Paris, Garnier, 1879, 177, col. 9–164.
34. ISIDORUS HISPALENSIS EPISCOPUS, *Etymologiarum sive originum*, Oxford, Clarendon Press, 1911, lib. 12, 21–24.
35. IVES, S. A., and LEHMANN-HAUPT, HELLMUT, *An English Thirteenth Century Bestiary*, New York, Kraus, 1942, pp. 5–6, 14.
36. JAMES, M. R., *A Peterborough Psalter and Bestiary of the Fourteenth Century*, Oxford, The Roxburghe Club, 1921, pp. 13, 24–25; fol. 1916, 1996.
37. JAMES, M. R. (ed.), *The Bestiary*, Oxford University Press, 1928, pp. 2, 29.
38. JONES, H. W. et al. (eds.), *Blakiston's New Gould Medical Dictionary*, Philadelphia, Blakiston, 1949.
39. KRAPPE, A. H., 'The historical background of Philippe de Thaün's *Bestiaire*', *Mod. Lang. Notes*, 1944, 59, 325–27.
40. LANGLOIS, CH.-V., *La connaissance de la nature et du monde au moyen âge*, Paris, Hachette, 1911, pp. 1, 3, 11, 38, 40, 43, 47, 328–30, 374.
41. LAUCHERT, FRIEDRICH, *Geschichte des Physiologus*, Strasburg, Trübner, 1889, pp. 7, 19–21.
42. LEWIS, C. T., and SHORT, CHARLES, *Harper's Latin Dictionary*, New York, American Book Co., 1907.
43. MANN, M. F., 'Der Physiologus der Philipp von Thaün und seine Quellen', *Anglia*, 1884, 7, 420–68; 1886, 9, 391–434.
44. MCCULLOCH, FLORENCE, *Mediaeval Latin and French Bestiaries*, Chapel Hill, University of North Carolina Press, 1960, pp. 95, 99, 116–18, 133.
45. MEYER, P., 'Le bestiaire du Gervaise', *Romania*, 1872, 1, 420–43.
46. *Idem.*, *Les bestiaires*, in: *Histoire littéraire de la France*, Paris, Imprimerie Nationale, 1914, 34, 363–90.
47. MORSON, FR. JOHN, 'The English Cistercians and the bestiary', *Bull. John Rylands Lib.*, 1956, 39, 146–70.
48. PETERS, EMIL, *Der griechische Physiologus und seine orientalischen Übersetzungen*, Berlin, Calvary, 1898, pp. 28, 48, 68–69, 99.
49. PFEIFFER, FRANZ, *Das Buch der Natur von Konrad von Megenberg*, Stuttgart, Aue, 1861.
50. POCKOCK, R. I., 'On the external characters of the beaver (*Castoridae*) and of some squirrels (*Sciuridae*)', *Proc. Zool. Soc. Lond.*, 1922, 2, 1171–212.

### *Medical Lore in the Bestiaries*

51. RENDELL, A. W. (trans.), *Physiologus*, London, Bumpus, 1928.
52. RICHTER, J. P., and RICHTER, I. A., *The Literary Works of Leonardo da Vinci*, London, Oxford University Press, 1939, 2, 261.
53. ROBIN, P. A., *Animal Lore in English Literature*, London, John Murray, 1936, p. 169.
54. SALMON, WILLIAM, *Pharmacopoeia Londinensis*, London, Dawks, 1696.
55. SINGER, CHARLES, *From Magic to Science*, New York, Dover, 1958, pp. 199-203.
56. STEIGER, CHRISTOPH VON, and HAMBURGER, OTTO (eds.), *Physiologus Bernensis*, Basel, Alkuin, 1964, pp. 58-59, 66-67, 108-9.
57. TALBOT, C., 'Medicine in medieval England', pp. 3-4 in POYNTER, F. N. L. (ed.), *The History of Medicine, 1066-1966*, *Med. News*, Suppl., October 1966.
58. TREASE, G. E., *Pharmacy in History*, London, Baillière, Tindall & Cox, 1964, p. 8.
59. URSINUS, JOHANNES, *Prosopopeia animalivm aliqvot*, Vienna, Mathias Bonhomme, 1541.
60. VINCENTIVS BELLOVACENSIS, 'Specvlvm natvrle', in: *Specvlvm qvadrplex, Tomvs primvs*, DVacvs, Baltasaris Bellervs, 1624, col. 1183.
61. WALBERG, EMMANUEL, *Le bestiaire de Philippe de Thäin*, Lund, Hj. Möller, and Paris, H. Welter, 1900, pp. xxviii, 42, 58, 79.
62. WHITE, BEATRICE, 'Medieval animal lore', *Anglia*, 1954, 72, 21-30.
63. *Idem.*, 'Traditional animal lore. The beast book in medical history', *St. Mary's Hosp. Gaz.*, 1961, 67, 83-88.
64. WHITE, T. H. (trans. and ed.), *The Book of Beasts*, New York, Putnam, 1954, pp. 28, 39-40, 93, 115, 131, 184.
65. WOODRUFF, HELEN, 'The Physiologus of Bern; a survival of Alexandrian style in a ninth century manuscript', *Art Bull.*, 1930, 12, 226-53.
66. WRIGHT, THOMAS (ed.), *Alexandri Neckam De naturis rerum*, London, Longman, Green, Longman, Roberts, and Green, 1863.