



ALBERTUS MAGNUS ON ANIMALS

A Medieval Summa Zoologica



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like the *cahab* which is a filler between the two, like the bone called the sesame, so that there might be a moderate extension and contraction of the bone.¹⁵⁶ For without this filler in the middle, the bones would grow too far apart when the member bent. An example is seen in bending the fingers. There would be no such joint arranged in this way if the bones had been prepared in another manner, nor would the motion of the members be well suited and light.

Some bones which are bound together at the ends have ends that are rather similar so that one end does not enter the other. At this place in these bones nature has laid down cartilage with virtually the softness of wool, lest the bones be worn away by striking one another. This is to be seen in the two *asseid* bones [radius/ulna] near the elbow. However, we have treated at length all these types of joints and many others in foregoing books.

¹⁵⁹ The flesh is held in place around the bones by slender ligaments. This is especially so for the flesh of the muscles, for in them there are hairlike nerves. The bones were created because of the softness of the flesh, as we have said above, and as is clear in sculptors who make figures of animals using mud or some other wet, soft material. When shaping the figures, they first form something hard and rigid underneath the clay to serve as a basis or support for the wet clay, keeping it from falling due to its own softness. Then they arrange the mud or other wet material over this. Nature acts entirely the same way in her use of bones, placing them under the fleshy parts. In members which are moved often, however, she also set down cartilage for the rubbing together. In members which do not move, she set down the bones for protection. An example is the rib structure which contains and protects the chest. This rib structure was not created for any purpose save the well-being of the members to the front which contain the heart. The bones in the rib structure near the belly are small so as not to hinder the expansion of the belly. This is due to two causes, namely, from food in male and female alike, and from pregnancy in the females alone.

¹⁶⁰ Further, the bones of a viviparous animal, whether internally or externally so, follow in all cases one and the same disposition with respect to hardness and strength. The bones of this animal will be larger than those of a nonviviparous animal, provided proportionate body size is considered. In many places there are very large animals, such as the elephants in India and in other hot, dry lands, and, in the North Sea, the great whales. When an animal has a large body it needs a framework which is stronger and harder because of the animal's weight. This is especially so when the animal is very

¹⁵⁶ *Cahab*: *Ar. Part. An.* 654a22, *astragalon*, "knuckle bone," which generally means the complex of the ankle bone (e.g., 1.300) but occasionally other multibone complexes are meant, as at 1.470. Here the plain meaning is of a single bone that sits between two others, helping to effect their juncture (Fonahn, 654). The sesamoid bones serve somewhat the same function in the wrist. Cf. 1.118-21, which bears no small resemblance to the present discussion.

strong and lives by hunting, like the unicorn [rhinoceros] and the panther.¹⁵⁷ But the bones of the males are stronger than the bones of the females, especially in carnivorous animals. Thus, the bones of the lion are very hard, so much so that when they are struck together they give off a spark as do two rocks struck together.

Likewise, even though they are aquatic animals, the dolphin and the whale [*bale-na*] have bones instead of spine, for they are viviparous. In nonviviparous animals which are blooded, nature changed creation a bit. This is clear in the birds, for birds' bones are weaker than other bones. In oviparous fish nature created spine and the bones of serpents also have the nature of fish spine. If they are very large serpents, it is an exception, for large serpents need a strong framework, just like that for a viviparous animal. Nature created the *celeti* out of spines and cartilage. It is necessary that the *celeti* be moist and therefore its support must be somewhat soft as well. The earthy part which is in this animal passed over into skin. In a viviparous animal there are many bones which resemble cartilage in composition. In the spots where this occurs it is so that the hard part is not entirely soft and mucus-like because it is only held by flesh.¹⁵⁸ An example is in the earlobe and in the very tip of the nose. However, the nature of bone and cartilage is the same, and they differ only in being more or less hard.

When the cartilage in a walking animal is cut into, it is found to be without marrow. For marrow cannot exist outside of its own vessel, separated by itself. If it were separated off by itself it would grow hard and would, in the cold or the heat of the air, become a cartilaginous substance or it would remain soft and mucus-like. The nature of the vertebrae of the *celeti*, however, is cartilaginous as is that of the fish called the *sturio* and the *buso* [sturgeons], for there is a bit of marrow in it.

Further, the feel of bone is like that of the uniform members, which are hooves, claws, *soleae*, the skin of certain creased animals, and the beaks of birds.¹⁵⁹ The creation of all these things in the bodies of birds is for the purpose of strengthening and assisting and they are all homogeneous, so that both the whole and the part share a name. For a *solea* and a part of a *solea* share a name and it is the same for the part and the whole of a horn and for all the others. For in these parts nature cleverly gave each animal this for its well-being and for defensive and offensive armament.

The nature of teeth belongs to this genus of member. They are used for the grinding and dividing up of food in all those animals which have teeth. In some, however, they serve the further purpose of strengthening and arming the animal. Such is the case for the strong teeth of wolves, and the tusks of boars and certain other animals. All these things are in the animals' bodies naturally and the nature of all these members is hard and earthy. For they are created for no other reason than strength as is the case

¹⁵⁷ The ferocity of the unicorn was legendary, especially when it did battle with the elephant. Cf. 22.144(106). One can be fairly sure from passages such as 12.224 that A. has the rhinoceros in mind and not the fabulous creature of tapestries.

¹⁵⁸ Cf. *Ar. Part. An.* 655a28f., which says that the parts are projecting and thus cannot be too stiff or they would snap off when bumped.

¹⁵⁹ On *solea*, cf. 3.77f., 135, and Glossary.

tion of their mouth, keeping the water from entering the inside of their stomach, as we have said before. Others do not need this sort of chewing, for they use a sucking action, or else they have teeth almost in their throat, moving toward one another with the movement of the gills. Thus, too, they can move both jaws. Certain animals have a mouth that is only for vocalizing [*loquendum*] or eating and they have no need for many rows of teeth in their mouths.

220 Just as there are sharp teeth in the walking animals of prey, so in birds of prey are there curved beaks and sharp, curved talons. They thus can seize things on the wing, hold them in their talons, and then use their beak to tear at what they are holding. Such birds as pick seeds have straight beaks which are thin at the ends. Such birds as browse in the mud have wide beaks, as we have said before. The beak is rather like the two rows of teeth, upper and lower, after they have been made solid, and as if the two jaws had been elongated and brought to a point.

Let, then, the things we said in the section on anatomy, along with these things, suffice on the nature and cause of teeth.

CHAPTER VII

On the Cause and the Nature of Horns on the Heads of Animals

221 Although we have already determined much on the members of the head, we should know that that part of the head which lies between the throat and the front part of the head called the *sinciput* is called the face [*facies*] or countenance [*vultus*].²³² With respect to this part no other animal whatever, except for the pygmy, is like the human. For the genus of monkeys is composed out of the shapes of a human and of other animals, and thus has a marked dissimilarity to the human in its face.

Some animals have horns projecting at the top of the head, on the *occiput* or the *sinciput*, and we should not pass over their nature. Animals which are viviparous have a head which properly displays the shape of a head. Certain other imperfect animals are said to have a head in a transferred sense only. They also participate in having horns in this improper and transferred way. For example, the forest scarab [*scarabeus silvanus*], which eats tree leaves and not dung, has horns which bear a resemblance in shape to stag horns.²³³ These are on its head and are movable, and it uses them to seize and hold.

222 However, horns which are true horns are given as armament, as is the case for stags' horns. Some animals, though, have weak horns, and are thus of little or no help to the animal in a fight. Such is the curved horn which is on the head of the mountain goat,

²³² Cf. *Ar. Part. An.* 662b17f.

²³³ A. is carefully differentiating between the stag beetle (cf. 2.96) and the dung beetle, *Scarabaeus sacer*, best known from Egyptian scarabs (Beavis, 1988, 157-64; *GI*, 83-85).

which the Germans call the *gemeze* [chamois].²³⁴ For this horn is small and weak and is shaped more to hold the animal. Thus, when the animal is scaling a cliff, it holds itself with its points as well as when it falls from the cliff.²³⁵ It is generally the experience in our lands that no animal whatever which has many splits in its foot and whose foot is divided into many toes has horns on its head. The reason for this seems to be that the armament of such animals lies in their teeth and claws, and a horn would therefore be superfluous. Some, as we have said, are strong in their teeth, some in claw, and some in horn. Nature, again, never gives what is superfluous. Others, however, have a horny sole [*solea cornea*] on their hoof [*cabx*] and have their strength in this. Examples include the horse and the ass.²³⁶ But animals which cleave their hoof in two have special strength in their horns. For a foot cloven in two is made for planting the foot strongly and for standing, and not as armament.²³⁷

Nature has given many types of defense to animals. Some of them are defended 223 against animals attacking them by the size and strength of their bodies, as are the elephant, the animal called the *seraph* [giraffe], the camel, and the like.²³⁸ Others are defended by their teeth and some of these, such as pigs, have tusks while their other teeth are even. Some have many sharp, sawlike teeth for seizing to the front of their mouth where the mouth opens. Some have hooves [*ungues*] and some have horny-soled hooves [*calces soleatas corneas*].²³⁹ Some have speed, like the hare, and others have two of these things. Thus, the horse has a hoof [*cabx*] as well as speed, and the deer and the *hinnulus* have speed along with horns.²⁴⁰ They fight weaker animals with their horns, but they flee stronger ones using their speed. There is a certain genus of wild cow (that is, ox) which has horns that bend back in on themselves and are not suited for fighting. Nature gave this one the power of casting its dung to the rear, far and forcefully, into the eyes of dogs and hunters following it. It casts it very far off and it is sticky so that it is not easily wiped off. The dogs and hunters following it are thus detained by wiping it off.²⁴¹

As we have said previously, nature gives many types of strength and defense to the 224 animals, and sometimes she gathers many types into one and the same animal. Thus, certain animals have both "soled hooves" [*calces soleatas*] and horns, as does the Indian ass [rhinoceros]. And because the nature of the right is very different from the nature of the left, there are sometimes two horns on an animal's head and sometimes only

²³⁴ Cf. 2.22, with notes, on this animal.

²³⁵ This story is repeated at 22.38(20).

²³⁶ Cf. 12.139 for wording and see Glossary for terms.

²³⁷ On the terms for feet used here, cf. notes to 2.8.

²³⁸ *Seraph*, as Schüthlein, 1661, points out, is from the Arabic *zarāfa* and is, in fact, the origin of our word "giraffe."

²³⁹ *Ungues* can also indicate claws.

²⁴⁰ Cf. 2.23 for a discussion of the *hinnulus*, probably a form of deer.

²⁴¹ This description ties this animal to the *bonachos* of 22.24(12), the European bison or, as they are called at 2.23, *bubali* or *wisent*.

one. Thus, the Indian ass has a solitary horn on its nose, and the animal which some of the ancients called the *archos* (that is, a sort of "prince"), but which we call the *unicornis* in Latin and the *rynnoceros* in Greek, has one horn of very great size.²⁴² It is solid like the horn of a deer and I have measured it as exceeding ten feet in length while its diameter at its base was more than a palm and a half. When an animal has one horn, this is located in the middle of its head since the middle of the head, whether on the forehead, the *sinciput*, or even on the nose, is the middle and shared boundary of the two extremes of the sides. Animals such as this, with one horn, have soles [*soleae*] or hooves [*calces*] with a whole or a cloven hoof [*ungula*]. But it is not a reversible statement, for those which have a horny hoof [*calces corneas*] for the most part lack horns. This is because nature has placed the material for the horns in the four feet, and one type of armament is adequate for it. She makes this placement in large and heavy animals, for they need strong support.

225 She placed the horns on the head because they arm the animal more fittingly and better there. Zeno, however, was wrong in criticizing nature because she did not put the bull's horns on its shoulders.²⁴³ He said that the bull could draw its yoke more forcefully if it had its horns on its shoulders. But nature did not give it horns for pulling. Rather, the function of the horns is to be considered for defense and this is done best by the head since it is easily spun and moved against harm from any direction because of the mobility it takes from the neck. They would be a burden if they were on other members like the feet, shoulders, or the like, and there would be a great hindrance created by the bones on which the horns would have to be anchored. On the head, however, they both strengthen the cranium and assist in the most suitable defense. If not on the head, it could not be put in the mouth, for it would interfere with feeding. Therefore, the most correct position is either in the middle of the head so that they can have equal weight or on each side of the head so that both sides can have an equal weight.

226 Some horns are entirely solid, like those of deer and of other animals which have a nature like the deer's, such as the elk and *hinnulus*. Other horns are hollow near their base but are solid to the front at the tip they use to fight. Solid horns are heavy, however, and such animals shed their horns. This is an easing and a purgation for them for

242. Cf. the etymology offered at 2.27 where the animal is shown to be a sort of gazelle. The Gr. stem *arch-* does, in fact, refer to rule, as, for example, in the nine *archois* in charge of ancient Athens.

243. The name Zeno belongs both to a philosopher born at Elea ca. 490 B.C., who succeeded Parmenides as head of the Eleatic school, and to a later figure who was the founder of the Stoic school. This latter Zeno, a student of Xenocrates, had emigrated to Athens ca. 320 B.C. A. was certainly familiar with the numerous logical paradoxes of Zeno the Eleatic which focused Ar.'s attention on the problems of local motion. Cf. *Phys.* 4.1.3 and 4.1.6. Among others, Zeno's famous paradox regarding the flight of an arrow—namely, that although apparently in motion it must in reality be at rest at each stage of its flight—is treated extensively at *Phys.* 6.3.1-4. The source of the claim that Zeno criticized nature's formation of the bull, however, remains unclear. Indeed, Sc. had offered A. the form *Altinoz* whereas the original of Ar. *Part. An.* 663b2f. tells of one Momus, a character in an Aesop's fable, who criticized a bull for having its horns on its head. A version of the fable can be found in Babrius *Myth. Aesop.* 59.8-10 (Perry, 1965, 74f.).

they are very earthy and are purged of the earthiness by the generation of the new horns, especially in the head where the brain is cold and there are many bones. Thus, there is a great deal of earthy, melancholic superfluity there. There is generally a large earthy part in a large-bodied animal which has sebaceous fat [*seposa pinguedo*]. It therefore has many large bones and the superfluity of its earthiness passes over into horns. There is no animal whatever found in our lands which is a runner and is swift and which has horns as large as does the mountain goat, which they call the *ibex* in Latin.²⁴⁴ For the horns of this one extend from its head to its rump. When it falls from a height it protects its entire body from striking anything with its horns and it absorbs the shock of large rocks with its horns as well.

The work of nature must be determined solely with respect to all the animals of the same species or to most of them. For there might sometimes be found a horned horse, just as a man is found with two heads.²⁴⁵ Monstrosities are also born in many other ways and these do not represent nature's intent, but rather such things occur due to the flaw [*occasio*] of some error of the natural principles, as we have determined in the second book of our *Physics*.²⁴⁶

As we have said, an animal with a large body and many large bones has great earthiness, as is easily seen by anyone using reason to consider natural things.²⁴⁷ Since earthiness of this sort is abundant in the matter, the food taken in is converted into its likeness. When the overabundant earthiness is thus multiplied, some part of it must pass into some member or other. In some it descends into the *sotulares* of the feet, whereas in others it descends into tusks, into sharp, long, sawlike teeth, or into horns. Because horns are often large, they draw to themselves so much earthy matter that it is taken away from the matter of the teeth of the upper jaw. Thus, animals with horns do not have front teeth in their upper jaw, since the matter is not adequate for both at once. But the lack of chewing their food is compensated for by rumination.

229 Nature does the best thing in all cases and she thus does not place the horn to the rear, for the animal could not see to direct the blow it was giving with it. If it were placed on the rump or the shoulders, it would impede the movement of the members and it would injure the bones on which it was anchored. She therefore did the best thing in putting them on the head. Now, no animal except for the Indian ass is found which has a solid, horny *sotular* and which also has a horn. This is because the matter for the horns descends to the feet and this too is why the ass has but one. Just as this is so, so too no animal save the unicorn is found with a split foot and a single horn. But the unicorn's horn is so huge and long that there is not enough matter for two of them. The smallest of the horned creatures seen in our land is the mountain goat,

244. See 22.105(54) for more on this animal about which A. shows intense interest, presumably from firsthand acquaintance in the mountains of his homeland and in the Alps during his travels.

245. On monsters, see Glossary.

246. *Phys.* 2.3.3.

247. Or "considering natural things with respect to (their) ratio."

which has red eyes, is said to have very sharp vision, and has a curved horn. In our tongue it is called the *gemeze* [chamois] and it travels in herds.²⁴⁸

230 One should know that the horns of the deer serve more as purgatives of its nature than as protective armaments. They therefore shed them. Because the females have less heat and earthy dryness, they thus do not have horns, since the horn is more an unnatural purgation than a natural defense. If it were entirely natural, it would be given to the females as well as to the males, for they have the same nature as the males, even though the horns of the females might be smaller than those of the males.²⁴⁹ This is why in other animals the horn is strongly rooted in the bone and is not shed. It rather grows hard and is given proportionally to the males and the females. For their nature is common, one and the same, and for this reason nature gave large teeth to the males and females in those animals whose armament lies in their teeth. Thus, while the sow does not have tusks due to her great moisture, she nevertheless has long teeth to the front and with these she tears and fights a great deal. Projecting tusks are in the males in the same way the horns are in the horned animals.

Let, then, these be the things said on the cause and the nature of the members of the head.

248. Cf. 12.222.

249. In this regard, cf. Cadden's learned discussion (1993) of the medieval conceptions of whether female and male had the same natures.

HERE BEGINS THE THIRTEENTH BOOK ON ANIMALS

In Which Is the Cause and Nature of the Inner Members



The First Tract, Concerning the Windpipe, Esophagus, and Lungs

CHAPTER I

On the Windpipe and Esophagus and Their Natural Causes

We have already set forth the members of the head and distinguished among them according to the forms proper to each of them. Their individual causes have also been given following the method promised. Once the things said here are joined to those said in the section on anatomy, then this will be sufficient for the present investigation.¹

The member which comes next beneath the head and which connects the head with the body is generally called the neck [*collum*], taking its name from the fact that a *colla* is a sort of connection and this member, as we have said, connects the head with the body.² Yet this connection is accomplished more to the rear on the vertebrae and nerves [sinews] of the neck, which are called "cervical" [*cervices*], and thus the rear part is what is properly called the neck. The front part, which is more a passage for air that is breathed in and of food which enters through the mouth, is more properly called the throat [*guttur*].

As we said before, a neck is not present in all animals but only in certain blooded ones whose head must necessarily have its proper movements apart from the movements shared with the body. Thus, nonoviparous quadrupeds and flying animals are the only ones found to have a neck.

In the front of the neck, in the area which has the name of throat, there are the parts which compose the throat. There is the trachea [*trachea arteria*], which is also called the *canna*, and the member which is called the *mery* in Arabic but the *ysophagus* in Greek. Because the trachea is to the front of the throat, it must be spoken of first.³

The trachea is created for breathing, just as the esophagus is created for eating. A blooded animal needs these two, namely, for air which enters from the outside for cooling and for the food which enters the stomach through the mouth and esophagus for nourishment. Thus, passages for these two things should be connected to the mouth. The place of entrance and exit for the air for cooling is through the trachea

1. *Ar. Part. An.* 664a12f.

2. *Isid. Orig.* 11.1.60 connects the word to *columna*. *Colla* can refer to "glue" and is a direct transliteration of a Gr. word with the same meaning. The etymology, however, is not in the *Ar.* passage.

3. Cf. the following with 1.240f., 419f.

the philosopher says that once, after all who were in a particular city had been freed from a pestilence caused by air and corruption, they fell into such a state of forgetfulness that they did not know their parents, their friends, or even their own names.¹⁸ For the soul and the body change each with the other and it is the natural order that the soul should restrain the body to keep it from being destroyed. And it is by reason of this continence that the accidents of the soul change the body. The pleasurable, imagined form moves the body and, conversely, the sufferings of the body serve to disturb the soul, as is apparent in sleep. Determination of these and other, similar matters has already been made elsewhere, however.¹⁹

- ¹¹ One of the characteristics by which the human is human is the capacity for being ashamed of an ill-done deed. This belongs to no other animal save the human.²⁰ This is the reason that incorrigible people are said to be called shameless, because to some degree they have been changed, moving from the honor of reason to assume an irrational, or cattle-like, nature.

Moreover, among the animals, the power of discerning the difference between what is honorable and what is base belongs to the human alone. From this it follows that it is a strictly human quality to pursue the honorable, whereas all brutes merely pursue what is useful and pleasurable.

It is also a strictly human trait to set his passions in order in accordance with virtue and to hold to the limit of reason those things which move in sensation. Likewise, although animals may be friendly among themselves, they have only the appearance [*species*] of friendship which is similar to the one which the Greeks call *ethayrica*, this being friendship that stems from the pleasure held by those who have been fed or nursed together.²¹ The human, however, possesses every conceivable type of friendship.

- ¹² Further, only the human has the power of speculation on intellectual theorems and of being delighted by a pleasurable thing that has no contrary. Therefore, only the human is a perfectly conjugal animal since he makes honorable marriages ordained by

18. The "philosopher" is Thucydides, describing in his history (2.49) the great plague which swept Athens, killing Pericles, in 430-29 B.C. Stadler suggests *De accidente et morbo* 5.7, but the identity of Galen's work is unclear. The editor of *QDA* (103n. 47) suggests that the title may in fact refer to Galen's *De morborum differentiis* (Kühn, 6:836-80), while Scanlan suggests *Cognoscendis curandisque animi morbis* (Kühn, 5:1-57), but there would seem to be no section 5.7 there and Kühn's index shows no reference to Thucydides in this work. In Galen's *De symptomatum causis* 1.6 (Kühn, 7:290), the plague is described as having arisen from corruption of the air and of putrescence, an explanation that is reminiscent of the present passage. Likewise, his *Quod animi mores corporis temperamenta sequantur* 5 (Kühn, 4:788) bears a reference to Thucydides and mentions not knowing one's relatives.

19. It is not at all clear where A. has treated this earlier, although he may have in mind passages such as at 9.77, in which he discusses the influence of mental images or phantasms of the soul on our dreams.

20. A. made this point at the very start of *DA* 1.50.

21. Gr. *hetairikē*, indicating comradeship.

laws. Simply put, he is the only civil animal since he has sharing, separation, dwelling together, treaties, and battles, all perfected and ordained by laws of urbanity.²²

It is also proper to the human to be able to learn by use of his reason, to be gentle by nature due to his civilized character, and to be an animal that can laugh and exult due to the perfect causes of rejoicing that are found only in the human.²³

We have already made a determination in previous books about the members of a human. But among those things which pertain to the human body is that only the human has a tall, broad, erect body. There is also the fact that the spittle of a fasting human heals abscesses when smeared on them and removes spots or scars. What seems even more wondrous is that if an arrow or sword is touched to the mouth of a fasting person and if another person is wounded with the arrow that has been thus wetted, the other person is infected.²⁴ Now, this is reported by the experts. Also, if the saliva of a person who has fasted for a long while is well thinned by the viscosity of food and falls into the mouth of or into a wound on a scorpion, serpent, or other poisonous animal in such a way that it penetrates to its inmost parts, it kills that animal.

Let what has been said about the human be sufficient, then.



The Second Tract on Quadrupeds

CHAPTER I

On the Nature and Traits That Quadrupeds Have in Common

By way of determining the nature of quadrupeds, we say, following Galen in his book *On Sperm*, that the genres of all quadrupeds have in common that in the reproduction of brute animals the sperm does not change according to the progress of the seasons and the workings of the planets and constellations as happens in the case of the human. Rather, they all have the same complexion as befits the first property implanted in the sperm.¹³

22. A.'s language has overtones. "Civil" is *civilis*; it implies citizenry, and thus an organized, civilized group of people working toward a common goal. *Urbanitas* has within it the Latin word for city and for A., as for Ar. before him, truly civilized people come together in cities.

23. Some of these "causes" of laughter are intellectual, while others are rooted in human anatomy. See especially 13.71 and 9.135, with note.

24. An explanation for this is provided at *QDA* 7.39.

⁹³ There is also an infirmity which some call "curve" [*curva*] since the horse bends its leg in a curved fashion, hindering its flexibility. What it is, however, is a swelling on the leg near the joint, either in front of the knee or in back above the knee, produced by concussion or impact with some hard object. This is how it is treated. The hairs are shaved and the entire swollen area is scarified with many deep blows. But do this cautiously so as not to hurt the nerve or the joint. Then rub it forcefully with a stick of green hazel wood. Then, the skin which is over the *curva* should be raised forcefully with an iron hook and a slender but strong thread should be inserted from the middle of the swelling all the way down to where it ends. Then, with a very sharp iron instrument make one round hole or more, through which the humor caused by the blow can exit. Then take strong soap with a bit of salt added, rub it forcefully, and it will be cured.

Let these, then, be the things said by us about the treatment of horses.

⁹⁴ There are things from a horse which are good for human medicine as well. For if the sweat of a horse is mixed with wine and is drunk by a pregnant woman it expels the fetus. If the hair from a horse's neck, which is called the horse's mane, is cut off, it removes the desire for intercourse from the horse.³¹⁶ Horse sweat also swells the face and brings on quinsy and foul-smelling perspiration. If a mare senses the smoke from a candle or an extinguished lamp, she will miscarry and the same holds true for certain other pregnant animals. If horse manure is used warm and with vinegar as a poultice, it checks the flow of blood whether it is burned or unburned.³¹⁷ If the flow is recent, even smelling the manure checks it. If daggers or swords are warmed and placed in horse sweat and they drink deeply of that humor, they become so poisonous that whatever a person wounds bleeds continually until it dies. If some woman cannot conceive and if mare's milk is given to her to drink unawares, and if a man couples with her directly after this, she frequently conceives. It is said that if the horse's hair is attached to the door of a house, it prevents mosquitos from entering the house through the door. The teeth from a male horse, placed either under or above the head of a snorer when he is asleep, keeps him from snoring. Teeth of a yearling [*pullus equinus anniculus*] hung on a child whose teeth are falling out will make their departure fast and pain free. If a pregnant mare should cross the trail of a wolf, she gets angry. It is also said that if a horse follows the tracks of a wolf or a lion for a long time, its feet fall asleep and grow numb to such an extent that it cannot move.

⁹⁵ (39) EQUICERVUS: The elk comes in two genres. One is the one about which we had much to say in previous books and is the one which we call the *elent* in German.³¹⁸ Solinus, however, says the elk is an animal of the East and of Greece whose

³¹⁶ Although *equus* is either generic or masc. in this context, at 6.118, A. cites Avic. as saying mares are especially lustful and that their lust can be curbed by cutting their manes. The belief was a commonplace in the bestiary tradition (Pliny *HN* 8.66.164; George and Yapp, 1991, 113; McCulloch, 1960, 128).

³¹⁷ A.'s grammar fails him here. His Latin may mean that the cure works whether or not the mixture is burned or whether or not cauterization is used.

³¹⁸ Cf. 2.22, with notes. Cf. ThC 4.35 for similar language.

males, but not its females, have horns. It has a mane on its neck descending all the way past its shoulders and it has a beard under its chin. It has feet [*soleae*] like a horse and a body about the size of a deer.³¹⁹

(40) EALE: The yale, according to Solinus, is a beast that is roughly like a horse. It has a tail like an elephant's tail, a black color, the jaws of a boar, and horns more than a cubit long.³²⁰ They say that its horns are adapted to any sort of movement because they are not rigid but rather move from their roots the way a member moves on its joint.³²¹ Thus, when it fights it sometimes puts one horn forward and folds the other one back, so that if one is blunted or harmed, the other one can come up to the defense. It is an aquatic animal and enjoys river waters.

(41) ENYCHYROS: The *enychyros* is an animal of the East, roughly the size of a bull, and it is somewhat similar to a bull.³²² But they have long hair descending on both sides of their shoulders and these hairs are softer and shorter than horse hairs. The color of its body is between black and red, tending more toward the black. Its hair is like wool on its other limbs. The voice of this animal is like that of the bull and its horns curve strongly inward and are useful for fighting. However, the hairs of its forehead make its forehead shaggy, hanging down here and there over its eyes. It lacks upper teeth, as does the bull, and its legs are covered only sparsely with hair. On its hooves it has horny *sotulares*, just like a horse. Its tail is short compared to its body. It paws the earth like a horse. It has tough skin that tolerates blows very well, sweet tasting and suitable flesh, and as a result hunters pursue it. While it is fleeing a hunter it sometimes stops and fights when it is tired out by fleeing. At such a time it ejects its dung over a space of four paces because when frightened it suffers diarrhoea accompanied by great flatulence. In any case it naturally has a lot of dung. It is remarkable that when this animal nears the time for giving birth, many animals of the same species gather around the one in labor and, defecating prodigiously, they gather the individual droppings into the shape of a wall around the one in labor.

³¹⁹ Solinus 19.19 is speaking of the *tragelaphos* (cf. Isid. *Orig.* 12.1.20 and Vinc. 18.55). Both A. and Solinus are fairly clear in stating that it is a type of deer (*cervus*). See George and Yapp (1991), 80-81.

³²⁰ Cf. Solinus 52.35, Pliny *HN* 8.30.73, ThC 4.36, Jacob. 88 (p. 182), and Vinc. 19.37. Note that Pliny says it is about the size of a hippopotamus, but Solinus changes the "river horse" to just a horse and his diction is as poor as the MS readings. To equate the yale with a rhinoceros (Stadler, 1400; Scanlan, 140) or the Indian water buffalo (George and Yapp, 1991, 111-12) is misleading. While there is some chance it may have begun as one of these beasts, it surely did not remain one for long once it reached the bestiary tradition. Surely, by the time it became a common heraldic animal it had entered into the realm of mythical beasts (Druce, 1911; Hope, 1911). McCulloch (1960, 190-92) discusses an alternative name of *centicore* found in a French bestiary.

³²¹ See the delightful illustrations in George and Yapp (1991), 112 and Payne (1990), 46-47.

³²² Cf. ThC 4.37 (*henichires*) and Vinc. 19.53 (*enchires*). Stadler suggests this is a version of Ar. *HA* 630a19f. and its description of the *bonasos*, and he cites 2.31 and 8.204 as other appearances of the animal but without the name. The *bonasus* is also A.'s *bonachus*; cf. 22.24(12). Stadler identifies the animal as *Poephagus grunniens*, better known as *Bos grunniens*, the "grunting cow," or yak.

117 The philosopher Gyrgyr says that the livers of all animals are good against liver pain.³⁹⁶ This is why a vulture which is suffering liver pain hunts for large birds and eats their livers. Galen says that if wolf lung that is cooked, dried, ground, and mixed with capers and the milk of a beast of burden is drunk, it is good for those suffering weakness of breath.³⁹⁷ If the head of a wolf is hung in a pigeon house, no cat, ferret, or any animal harmful to pigeons will approach. If someone should carry the heel of a she-wolf on his lance, and other lancers should come against him, they will not harm him as long as the heel remains on the lance. Wolf bile, mixed with a grain of musk and held to the nostrils at the beginning and in the middle of the month, is good for someone who has epilepsy. When the bile is mixed with rose oil and is smeared on someone's eyebrows, he will be beloved by the women when they go walking with him. If someone mixes the right testicle of a wolf with nut oil and gives it to a woman to put in her vulva with a bit of wool, it will take away from her the desire for intercourse, even if she is a whore. Wolf's blood, mixed with oil and instilled in the ear, is of use in deafness. If someone carries with him the teeth, skin, and eyes of a wolf, he will be victorious at court if he has a lawyer and he will be rich among all nations. If wolf's penis is roasted in the oven and sliced, and part of it is chewed, it immediately arouses desire for intercourse. If its tooth is hung on someone, he will lose all fear. A large drum made out of wolf's skin and beaten causes other drums to beat as well.³⁹⁸

If the flesh of a wolf is ground and is cooked with a bit of pepper and with honey whose froth has been removed, it is good for those suffering from colic. If the stomach of those suffering this is bound in wolf skin, it is effective, and if the sufferer regularly sits on this skin, it is good for him. Wolf excrement that is cooked with thin white wine and is drunk is very effective for those with colic and it is said that if a wolf's skin is suspended on the hip and is bound there with a thread made from fleece a wolf has bitten, it is good for the same thing. If the right eye of a wolf is suspended on a boy, it removes fear from him, as do its teeth and skin. If its tail is buried in a town, it prevents wolves and weasels from entering it as long as it remains there.³⁹⁹

118 (69) LUTER: The otter is a familiar animal, longer than a cat but with a broader body, a long tail, and short legs.⁴⁰⁰ It is dusky in color but its pelt has a shininess to it, which is why the trim on clothes is made from it. It lives in burrows above water and lives by hunting fish. Although it is a breathing animal, it nevertheless stays under water a long time and it therefore sometimes dives and enters fish traps for its prey.

It so fills its burrows with a multitude of fish that it taints the surrounding air. It is sometimes made tame, whereupon it drives fish into nets. It is a most playful animal when it is tamed. It has sharp teeth and is very prone to bite.

396. Scanlan (158), citing Thorndike (1929, 2:718), suggests Girgith of Babylon, also called Ger-math, an author of astrological works.

397. "Capers": Borgnet reads *pipere*, pepper.

398. Although, from the statement A. made at 22.116, no one will hear it.

399. "Town": *villa*, always a difficult word; perhaps "estate."

400. ThC 4.66, s.v. *De lutere qui et lotter dicuntur*. Cf. Vinc. 19.89.

Its flesh is cold and foul smelling. Its skin is said to have an effect against paralysis. It eats food other than fish, but it loves fish best of all its food.

(70) MULUS: The mule is a familiar animal, fit for work, taking after the ass more than the horse.⁴⁰¹ The hinny [*burdo*] is the opposite, since the male's seed is the active and formative force.⁴⁰² Thus the mule has the voice of an ass but the hinny of a horse. Nevertheless, each is generated from semen that is quite different in complexion and this is the reason for the sterility in them, as has been discussed at length in preceding books.⁴⁰³ Mules do reproduce, however, on occasion in warm lands in which the external heat tempers the internal coldness of the ass.

If the hoof of a mule is used to fumigate a house, mice flee it. If a person takes mule marrow in an amount equal to the weight of three *aurei*, he will be struck dumb. If two mule testicles are bound together in mule skin and are hung on a woman, she will not conceive as long as she shall have them on her person.

The other things concerning this animal have been said in preceding books.

(71) MONOCEROS: They give the name *monoceros* [unicorn, rhinoceros] to an 119 animal that is composed from many animals. It has a terrifying bellow, the body of a horse, the feet of an elephant, a pig's tail, the head of a deer, and in the middle of its forehead it bears a horn which is beautiful for its wondrous splendor. The horn is four feet long and is so sharp that it easily pierces everything it strikes with one blow. The animal is almost never able to be tamed and hardly ever comes into the power of men while still alive, for seeing itself beaten, it kills itself in a rage.⁴⁰⁴

(72) MOLOSUS: The *molosus* is a huge beast found in many places. It has a large mouth opening and huge, strong teeth which stick out. For this reason it fights long and hard. Although it is horrifying and hostile toward people, it nevertheless fears the blows of children and flees them.⁴⁰⁵

(73) MARICON MORION: The *maricon morion* is, as we have said in previous books, a beast seen but rarely in the East.⁴⁰⁶ Its size is that of a lion and its color is red-dish. It has three rows of teeth in its mouth. While it has the feet of a lion, its face,

401. Cf. Isid. *Orig.* 12.1.60, ThC 4.68, and Barth. 18.70; and see George and Yapp (1991), 114-15.

402. The *burdo* is the result of the union of a stallion and a she-ass. Cf. 1.104, 16.137. It also gave its name to an organ pipe (19.43).

403. Cf. 16.130f.

404. It is always difficult to know when a medieval author is speaking about the unicorn of legend or the rhinoceros of fact. This passage seems more like the former than the latter (Shepard, 1956; George and Yapp, 1991, 86-89; McCulloch, 1960, 179-83). For *monoceros*, cf. Pliny *HN* 8.31.76, Solinus 52.39, ThC 4.69, Vinc. 19.91, and Jacob. 88 (p. 179). The actual animal is the Indian rhinoceros, or *Indicus onager*, of 22.126(84).

405. Cf. ThC 4.70, citing Ald. *Aen.* 1.12, and Vinc. 19.91. While this creature surely originated in the famed Molossian hounds of ancient Greece (Hull, 1964, 29-30), it is a mistake to insert the word "dog" into the translation (Scanlan, 161). Neither A. nor ThC gives any indication that they thought the *molosus* was other than a wild beast.

406. Cf. 2.49, with notes. The animal is the ancient manticore, the next animal in A.'s list. Stadler points out that this description is ultimately derived from Avic. *DA* 1.3v.

¹²⁵ (81) MARTARUS: The marten is an animal with the shape of a weasel and the size of a cat, but it is longer and has shorter legs.⁴³¹ It is tawny on back but white on the belly and throat like the weasel. It has shorter claws than the cat and has two genuses, one called the beech marten and the other the fir marten. The one that builds its nests in the fir tree is prettier by far.⁴³² Both genuses intermix in any combination, but the beech-tree variety seeks marriages with the one called the fir-tree variety as if because of its great nobility. The pelt of either one is precious and remains beautiful for a long time. All genuses of this animal as well as the weasel have in common that when angry they become very foul smelling and that they are animals that are almost never at rest, even when they are tamed.

(82) NEOMON: *Neomon* is the Greek name for the beast which is called *suillus* ["piggish"] in Latin since it has bristles instead of hair.⁴³³ It distinguishes between food that is good for it and poisonous food by the food's odor. This beast hunts serpents and when it fights with an asp it holds its tail erect and the asp sees this as a threat. It thus transfers the asp, deceived in this way, into its power.

¹²⁶ (83) ONAGER: The onager [*onager*] is a wild ass [*asinus ferus*] and, according to some, on the fifteenth day of March it brays twelve times at night and twelve times in the day to indicate the equinox.⁴³⁴ There are wild ones in Africa and the males preside singly over single herds of females. The females are very lusty and for this reason become tedious to the males. It is said that the male is jealous and therefore nips off the testicles from its son when it is born, and for that reason the sons are laid up in hiding places by the mothers.⁴³⁵ When a hunter pursues an onager with dogs, it emits odiferous excrement which is delightful to the dogs and thus detains them around it while it flees to safer places. It, more than all other animals, flees human company. It

⁴³¹ ThC lacks an entry for the marten and indeed it is little treated by the medieval authors. Cf. 22.133(96).

⁴³² These species would apparently be the beech or stone marten (*Martes foina*) and the pine marten (*Martes martes*).

⁴³³ It is clear by comparing Isid. *Orig.* 12.2.37 that this is a mangled form of the *ichneumon*, which is both a mongoose and an enemy of the crocodile, as a variant of the *ydrus* (McCulloch, 1960, 129; George and Yapp, 1991, 100-101). The supposed other name of *suillus* is also taken from Isid., who himself is quoting Draconius, who says that pigs kill snakes. Isidore adds that they raise their tails before doing so. Cf. ThC 4.79, who quotes Isid. correctly, and Rabanus Maurus *De universo* 8.1 (PL 111:225D), who reports on both the *ichneumon* and the *suillus*.

⁴³⁴ *Ferus* is, lit., "fierce" and is unusual for A., who prefers *silvestris* in this context and as found in ThC 4.80. A. is, in fact, accurately quoting Isid. *Orig.* 12.1.39, who derives the etymology through the Gr. *omos*, "ass," and *agrios*, "wild," which is *ferus* in Latin. Cf. Barth. 18.76, who has misread and gives his readers *asinus verus*, "the true ass." McCulloch (1960, 144-45) reports that in one bestiary not only is the ass said to bray twelve times to mark the equinox but the monkey is reported to urinate seven times. Cf. Peter Damian *De bono religiosi status* 23 (PL 145:783B) and Vinc. 19.94-96. See also George and Yapp (1991), 84; White (1954), 82-84; and Curley (1979), 15.

⁴³⁵ This story traces back to Pliny *HN* 8.46.108 and Solinus 27.27. Curley (1979, 15) renders the foul deed charmingly: "the father will break their necessities so that they produce no seed." A MS at Trinity College shows the deed in progress with the colt whining piteously (George and Yapp, 1991, 85).

endures thirst very poorly and seeks very clear water to drink. When aroused by lust, they stand on cliffs, drawing in the wind to moderate the heat of their lust.

(84) ONAGER INDICUS: The Indian onager [Indian rhinoceros] is different from the one just mentioned.⁴³⁶ It has great size and strength and bears a huge horn in the middle of its forehead. As if by way of displaying its courage, this animal sometimes breaks rocks off cliffs, for no other reason than as a demonstration of its strength. It has very sharp, solid hooves.

(85) ONOCENTAURUS: The ass-centaur, so they say, is a composite animal, for it has the head of an ass and the body of a human. Some are said to be found with the body of a horse and the upper parts of a human.⁴³⁷ It is thick with bristles and has hands adapted for any activity, and they sometimes begin to talk although they can never form the human voice perfectly. They throw rocks and branches at those that pursue them.⁴³⁸

(86) ORIX: The oryx is an animal like a roebuck, about the size of a he-goat. It ¹²⁷ has a beard under its chin, lives in the desert, and is easily tricked into a snare. It is numerous in the deserts of Africa and has as a particular trait the fact that its hair is turned toward its head. It is born in that part of Africa which lacks water.⁴³⁹

It is also said that if water from its bladder is carried off, no matter how small the amount, it is a remedy against a long thirst. This is why robbers in Gaetulia [Morocco], a land that lacks water, always carry some with them.⁴⁴⁰ This animal rejoices in wondrous fashion at the rising of the Dog Star [Sirius] because it grows strong then.

(87) ORAFLUS: The *oraflus* [giraffe] is an animal that surpasses all other animals in the appearance of its coloration.⁴⁴¹ In its forequarters it is so tall with its head extended that it attains a height of twenty cubits. In its hindquarters, however, it is

⁴³⁶ Cf. the *monoceros* of 22.119(71). Here, however, we can be rather sure of an identification of *Rhinoceros unicornis*. Ar. *HA* 499b18-19 used the name *onos Indikos*, "Indian ass." Cf. ThC 4.81 and Vinc. 19.95.

⁴³⁷ The ass-centaur is linked with the siren in the *Physiologus* (Curley 1979, 23-24) and in bestiaries (George and Yapp, 1991, 78-79). Cf. Isid. *Orig.* 11.3.39, Jacob. 88 (p. 182), Vinc. 19.97, ThC 4.82, and Barth. 18.77 (who, citing a gloss on Isa. 34.14 that can be traced back at least to Haymo of Halberstadt's *Commentarium in Isaiam* [PL 116:893], breaks the word strangely and makes it half bull, *est animal monstrosum ex tauro et asina procreatum*). The animal surely worked its way into the tradition from the Vulgate's *onocentaurus* (Isa. 34.14).

⁴³⁸ This is commonly shown in Gr. and Roman representations. Most centaurs were wild creatures, as in the famed battle between the Lapiths and Centaurs. A few, such as Chiron, were gentle and learned. On centaurs in general see King (1995), 141-43.

⁴³⁹ Barth. 18.78 speaks learnedly about the translation of Isa. 51.20, where the sons of Israel are said to be ensnared like the Hebrew *tho*, some sort of hoofed creature, translated into the Vulgate as *oryx*. Barth. is wrong, however, in saying the animal is unclean (cf. Deut. 14.5). Cf. ThC 4.83 and Vinc. 19.98, who have many more details than does A. Since there is no mention here about the startling horns of today's oryx, *Oryx beisa*, A. was probably unaware of its appearance.

⁴⁴⁰ Pliny *HN* 10.94.201.

⁴⁴¹ Cf. ThC 4.84. Cf. 22.16(5), where the giraffe is the *anabula*, and 37(19), where it is the *camelopardulus*.