

# Sleepy Animals: Barhebraeus (1226-1286 CE) on Sleeping and Dreaming among Animals

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This paper investigates which animals sleep and wake in general and which, in addition, are also able to dream, according to Barhebraeus (Bar 'Ebroyo, Arabic: Ibn al-'Ibrī, 1226-1286 CE), the famous Syrian Orthodox polymath and theologian. Attention is also given to the authors who are his primary sources, namely, Avicenna and Aristotle. Parallel examples include Albert the Great as another author who is dependent on some of the same sources and Pliny the Elder as a Latin author without Arabic influences. Roughly, Avicenna and Barhebraeus can be understood as allowing for or stating the observation of far more dreaming animals than Aristotle himself did explicitly, while Albert allows for even fewer. The question of why on this matter Barhebraeus relied primarily on these two authors as his sources, though not on other post-Avicennan Arabic authors as he did in many of his other philosophical and even theological works, will also be briefly discussed. This select reliance could be connected to a historical change in the topics dealt with in the scientific curriculum, with the lack of coverage of zoological topics by Barhebraeus's favorite source authors being one of the reasons that led him to rely on the older texts by Avicenna and Aristotle. However, this cannot be generalized as a rule, as there are at least two contrary cases in Barhebraeus's works on physiognomics where he has had recourse to an older text rather than a treatise by one of his otherwise preferred source authors.

*Keywords: Barhebraeus/Bar Hebraeus (Bar 'Ebroyo, Arabic: Ibn al-'Ibrī, 1226-1286 CE), Aristotelian philosophy, Syriac philosophical works, Arabic philosophical works, Aristotle, Avicenna, Albert the Great, animals, sleeping, waking, dreaming, viviparous quadrupeds, mammals, physiognomics*

## **Introduction**

Avicenna (Ibn Sīnā, 980-1037 CE), Barhebraeus (Bar 'Ebroyo, Arabic: Ibn al-'Ibrī, 1226-1286 CE), and Latin authors such as Pliny the Elder (d. 79 CE) and Albert the Great (d. 1280 CE) depend heavily upon Aristotle for their treatment of sleeping, waking, and dreaming among animals, copying passages from him verbatim, regardless of whether and in which translation the text was accessed. In the following, the stance of Barhebraeus will be briefly recapitulated concerning the species or classes of animals observed to sleep, wake, and dream,

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This article is part of the thematic section *Knowledge Collaboration among Jews, Christians, Zoroastrians, and Muslims in the Abbasid Near East II*, guest editor: Nathan Gibson. To read all related articles, please access: [doi.org/10.1553/medievalworlds\\_no18\\_2023](https://doi.org/10.1553/medievalworlds_no18_2023).

though not the rich tradition of Arabic oneirocritic literature,<sup>1</sup> the assumed physiological or psychological processes involved in producing or having dreams,<sup>2</sup> veridical dreams and the role of universals in them,<sup>3</sup> trying to define sleep and waking or dreaming,<sup>4</sup> or philosophical challenges by a dreamer's statements about dreaming.<sup>5</sup> Before looking into the reason for the unexpected absence of post-classical or contemporary Arabic sources from Barhebraeus's works on this topic, his identifiable sources will be investigated, a prerequisite for assessing the changes he himself introduced.

### *Aristotle*

According to Aristotle's *Historia Animalium* (*History of Animals*), 4.10, all footed<sup>6</sup> and blooded animals sleep and wake, and those with eyelids additionally close them while sleeping. Man and viviparous quadrupeds are also able to dream, which he illustrates with horses, dogs, oxen, sheep, and goats. A testimony for the ability of dogs to dream is seen in their barking during sleep.<sup>7</sup> Oviparous (egg-laying) animals as well as fish, cephalopods (marine molluscs), and crustacea (hard-shelled animals) are said to spend little time asleep (βραχύσπννα),<sup>8</sup> while the ability to dream is unclear for oviparous animals and water animals. Aristotle then elaborates on the sleep of fish. Humans are said to dream most among all animals, with an onset of dreaming around four or five years of age. While some humans have an onset of dreaming only later in life, some never dream at all.

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- 1 Introductions into this vast literature are, for example, given by Fahd, *La divination arabe*, 247-367; Lamoreaux, *Early Muslim Tradition*; and Lory, *Le rêve*. Besides the influential Arabic translation of Artemidorus's Greek text (*Kitāb Ta'bir al-ru'yā*), Ibn Sirin's (d. 728 CE) *Tafsīr al-aḥlām* (*Interpretation of Dreams*) in particular gained some fame (though see Lamoreaux, *Early Muslim Tradition*, 19-25, on some doubts on the authenticity of extant texts ascribed to him).
  - 2 For example, an overview is given by Gallop, *Aristotle: On Sleep and Dreams*, 6-32; see also Hansberger, Representation of which reality?, for imagined objects in dreaming according to the Arabic *Parva Naturalia* tradition.
  - 3 See, for example, Struck, *Divination*, 91-170, for the case of Aristotle; Hansberger, Averroes on divinatory dreaming; and *eadem*, How Aristotle came to believe.
  - 4 Aristotle defines sleep as not being conscious of some stimulus in his *On Sleep in Parva Naturalia*, trans. Hett, 321, on which see also van der Eijk, *Medicine and Philosophy*, 176-177; bodily characteristics are discussed in Moorcroft and Clothier, An overview of the body.
  - 5 Challenges posed by being aware of dreaming during a dream, that is, lucid dreaming, have been discussed by Malcolm, *Dreaming*; see for an overview Green and McCreery, *Lucid Dreaming*, and also Hobson, *Dreaming*, 126-127, and, for bodily characteristics, Moffitt and Hoffmann, On dream psychophysiology, 151-154. A similarity is also found in Papachristou, Aristotle's theory of »sleep and dreams«, 16, regarding Sophonias's elaboration of Aristotle's distinction between dream and phantasm.
  - 6 Ὅσα πεζὰ, Aristotle, *Historia Animalium*, ed. Balme, 536b24-25. (Bekker numbers are used for citations of Aristotle, here and throughout.) Footed and walking animals are assumed as equivalent in this context.
  - 7 The extant Arabic translation, ed. Filius, 212, reads: »All blooded [and] walking animals ... This is clear due to sensation. All animals having eyelids close them during sleep. This is obvious. We get to (the point) that some animals dream in their sleep, not only man, but the horse, dog, ox, goat, and all [animals] that are related to those animals that have four legs and give birth to animals like them. This is obvious by the barking of dogs when they have dreams.«
  - 8 Aristotle, *Historia Animalium*, trans. Peck, 2.83-89; *Arabic Version*, ed. Filius, 212: »Animals that lay eggs sleep lightly (*da'ifan*). Marine animals, such as fish and those with a soft shell, have a light (*yasir*) sleep. All those [animals] that we have described as sleeping do so in an obvious manner.« *Yasir* is a bit ambiguous and can also, in the sense of »little«, denote a sleep of a short duration.

However, among his list of dreaming animals, the case of humans is the most obvious, as other viviparous quadrupeds are said to seem<sup>9</sup> to dream: as already noted, Aristotle argues that dogs' barking during their sleep manifests dream activity.<sup>10</sup> Similarly, sleeping and waking as found with footed and blooded animals is argued for from observation,<sup>11</sup> which is usual for the *Historia*. While Aristotle voices more uncertainty about oviparous animals' ability to dream than for viviparous quadrupeds, he asserts that humans, nonetheless, dream most, with the exception of children. However, oviparous animals as well as insects and marine animals<sup>12</sup> have, according to Aristotle, at least some sort of sleeping and waking with a sleep of a short duration.

Additionally, one might understand from at least two further statements in the *Parva Naturalia* corpus that Aristotle allowed there for more animals dreaming than he did in the *Historia*. In *De Insomniis* (*On Dreams*, 461a26), he speaks of dreaming in blooded animals generally, where the blood is responsible for the persistence of sense images, which leads, in turn, to actually undergoing external perception.<sup>13</sup>

In *De Divinatione per Somnum* (*On Prophecy in Sleep*, 463b12), he states that »some of the other animals« do dream,<sup>14</sup> and, therefore, dreams cannot be sent by God, even though they have a divine origin.<sup>15</sup>

However, assuming the *Historia* passage to be more elaborate and therefore to be upheld in cases of deviations between the texts, the *Parva Naturalia* parts could be understood not as allowing for animals besides viviparous quadrupeds to dream, including, perhaps, oviparous animals, but, rather, as being formulated loosely.

Nonetheless, sleep in general also recurs briefly as a topic within the biological works in the *De Generatione Animalium* (*Generation of Animals*, 5.1 778b), and this passage could be understood as granting all animals at least the ability to sleep. For the young of all animals (πάντων), especially those with imperfect offspring (τῶν ἀτελῶν),<sup>16</sup> are prone to sleep after having acquired sensation.<sup>17</sup>

9 Φαίνονται, Aristotle, *Historia Animalium*, ed. Balme, 536b27.

10 Windt, *Dreaming*, 45, has questioned whether the barking of a dog during sleep contradicts Aristotle's own definition of sleep. (Gallop's translation as »whining«, Aristotle, *De Somno et Vigilia in Parva Naturalia*, trans. Gallop, 175, would not make a difference in this regard. According to Liddell et al., *Greek-English Lexicon*, however, the Greek ὑλαγμός is usually »barking«.) Looking at classical literature on this topic, Seafeld, *Literature and Curiosity of Dreams*, 2.36-37, cites Macnish as also mentioning the neighing of a horse during its sleeping. Macnish assumes dreaming actually to be found with nearly all animals, *Philosophy of Sleep*, 45-46. Seafeld, *Literature and Curiosity of Dreams*, 37-38, further cites Dendy, *Philosophy of Mystery*, 274, as assuming that birds sometimes sing when dreaming, thus adding to the Aristotelian list.

11 Φανερόν ... κατά τὴν αἴσθησιν, Aristotle, *Historia Animalium*, ed. Balme, 536b25-26.

12 These animals seem to include fishes, cephalopods, and crustacea here, though possibly not cetacea, as some are discussed later on in the text.

13 Aristotle, *Parva Naturalia*, trans. Hett, 363-365.

14 Τῶν ἄλλων ζῴων ... τινά, which Hett translates in this context as »lower animals«, Aristotle, *Parva Naturalia*, trans. Hett, 379. The contrast, however, seems to be with humans generally. In that case, Aristotle would intend that some non-human animals do also dream.

15 Aristotle, *Parva Naturalia*, trans. Hett, 379.

16 That is, further nascence is required; cf. *De Generatione Animalium*, trans. Peck, ii.1; Peck's translation is based on his own conjecture, 488 n. 1.

17 Aristotle, *De Generatione Animalium*, trans. Peck, 489.

Again, one could also assume the more elaborate discussion of the *Historia* to be decisive for animals' ability to sleep in case of diverging statements. However, in chapter I of *De Somno et Vigilia (On Sleep)* from the *Parva Naturalia*, he opens with a discussion that can be understood as granting all animals a returning period of sleep as a necessary rest for their sense organs (454a20-25). After this theoretical consideration, he states that nearly all (σχεδὸν πάντα, 454b15) animals have been observed (ὤπται, 454b17) to sleep, except for testacea (shelled molluscs), which had not been directly observed.<sup>18</sup> This would then point to the *Historia's* passage being concerned with a list of observations that do not have to be exclusive and are not necessarily opposed to granting all animals the ability to sleep.<sup>19</sup>

### Avicenna

Similar to its treatment in Aristotle's *Historia*, the topic of animals sleeping and dreaming is also covered in Avicenna's *Animals* in his most extensive Arabic *summa*, the *Book of Healing*,<sup>20</sup> where he comes up with the following on sleeping, waking, and dreaming:

With regard to the sleeping of animals, all blooded [and] walking animals sleep and wake. All having an eyelid close it during sleep. Also, others besides humans [lit., man] dream. Among quadrupeds, this is obvious from their characters, motions, and voices during sleep. The sleep of oviparous animals is light (*khafīf*), not deep (*ghayr ghariq*). And similarly for the crustacea (*layyin al-khazaf*),<sup>21</sup> even though their sleep is not obvious by their eyes, as their eyes do not have eyelids (*ashfār*). Rather, their sleep is detected by their tranquility and [by the fact] that they may sometimes be caught by the hand while they are inattentive or that they get hit by a trident. All fish sleep more at night than during the day. Some marine animals sleep on the ground, some on the sand, some on rocks, some in a pit, and some in a rock channel at the shore (*shatṭiyya*). For those sleeping in the sand, a form will arise in the sand that signifies their being hidden in it, thus, they will be hit by a trident.<sup>22</sup> The ray (*salāsī*)<sup>23</sup> might sometimes be sunken into sleep such that it will be caught by hand. The dolphin sleeps while its blowhole is protruding, and it breathes through it. Its snoring is heard while it sleeps. Insects also sleep. Their rest and quietness signifies this.

A juvenile person does not dream in a way considered as such until [reaching the age of] four years. Some humans [lit., men] do not dream until they get older, though others do not dream at all.<sup>24</sup>

18 Again, βαχχύπτηνα is used for the sleep of insects and »hard-eyed animals«.

19 For example, Kroker, *The Sleep of Others*, 32, stresses the fact that the list of dreaming animals in the *Historia* consists of domesticated animals only (and thus ones which might be subject to closer observation). Gallop, *Aristotle: On Sleep and Dreams*, 35, considers sleep to pertain generally to all animals, though dreams only selectively.

20 The general title *Animals* is a reference to the Arabic tradition that combines Aristotle's *Historia Animalium*, *De Partibus Animalium (On the Parts of Animals)*, and *De Generatione Animalium* into one single book. His other biological treatises such as *De Motu Animalium (Movement of Animals)* are not attested in Arabic, though their title is mentioned in some instances; see Kruk's Introduction in Filius, *Arabic Version*. The *Parva Naturalia* texts had been freely translated into Arabic (see Hansberger, *Kitāb al-Ḥiss wa-l-maḥsūs*; she is also preparing an edition), but do not seem to have influenced Avicenna in this particular part of the *Animals*. Yet they do elsewhere, probably also influencing Barhebraeus indirectly (see below).

21 According to Filius's *Arabic Version*, Glossary, s.v., these are malacostraca.

22 *Mishqaṣ*, lit. »arrow«, though here short for the abovementioned arrow with three bent spikes, rendered as »trident«.

23 Cf. Filius, *Arabic Version*, Glossary.

24 Avicenna, *Animals*, ed. Muntaşar et al., 64-65 (my translation).

Avicenna follows Aristotle in keeping bloodedness and having feet (or the ability to walk) as the requirement for sleeping and waking. Like Aristotle, he includes other animals, such as marine animals, insects, and oviparous animals, as having at least lighter forms of sleep and waking. He also speaks of a light (*khafīf*) sleep of oviparous animals,<sup>25</sup> though he omits Aristotle's doubts as to whether they might be able to dream at all. Similarly to Aristotle, the case of dreaming is only said to be *obvious* for quadrupeds, though, taken literally, it is not necessarily limited to them. Being viviparous has been entirely dropped as a requirement. Theoretically, this would allow for oviparous quadrupeds, such as turtles, to be included. In place of the viviparous/oviparous distinction, he seems to have combined Aristotle's primary group of dreaming animals with the example of the dreaming dog. Therefore, Avicenna could be understood as allowing for more animals to dream than Aristotle does, with quadrupeds being only the most obvious case.

Regarding human dreams, a late onset of dreaming (or at least the awareness of it) is not connected to health.

In the *Interpretation of Dreams*, whose authorship by Avicenna has been called into question by Gutas,<sup>26</sup> who attributes it to Abū Sahl al-Masīhī instead,<sup>27</sup> the author explains sleep similarly to Aristotle as a necessary rest for those organs that the soul in an animal uses in order to recover. This can be understood as including all animals here as well.<sup>28</sup>

#### On What Sleep Is and Why the Animal Needs It

An animal's body and organs, though being instruments that the soul uses, are not instruments that can be used permanently. For the power of those organs is finite, becoming exhausted, weak, and unable to perform. When they are weak and incapable, they require rest and relaxation for their power to be restored. Afterward, the soul will employ them again. This rest and relaxation that they have is sleep.<sup>29</sup>

As all animals have a soul, at least an animal and a vegetative one, and also a body, this seems to be intended as applicable to all animals. Thus, all animals would be considered to need sleep after a certain time, perhaps a span that varies individually or by species.

As with the case of Aristotle, one could grant the more elaborate Avicennan passage – that of the *Animals* – a decisive role that further limits the group of sleeping animals or those able to sleep over against the more general statement in the epistle on the *Interpretation of Dreams* (regardless of its true author). But, again, a possible approach would also be to see the *Animals* passage as a limited observation of a general, theoretical rule or requirement.

25 Avicenna distinguishes deep sleep (*ghariq*), at least for humans, in his *Canon*, ed. al-Ḍanāwī, 1.241, as the best (kind of) sleep (a translation of this passage is also found in *Canon*, trans. Abu Asab *et al.*, 297-299). His treatment of the topic in the *Canon* is heavily influenced by Galen and does not consider animals.

26 See Gutas, *Avicenna and the Aristotelian Tradition*, 208-209 and 526. In his *Study of Avicenna*, 51, he bases this suggestion on a list of contradictions with other works as well as a lack of older manuscripts.

27 Gutas, *Study of Avicenna*, 51, refers to the list of works by Abū Sahl al-Masīhī as found, for example, in Ibn Abī Uṣaybi'a, *Uyūn al-anbā' fī ṭabaqāt al-aṭibbā'*, ed. and trans. Savage-Smith *et al.*, no. 11.12 (ed. 2-2.808; trans. 3-2.894-895), where such a title is listed. This argument, however, might be less than compelling, as several authors wrote on this topic.

28 This general statement seems to be influenced by the transmission of the *Parva Naturalia*, whose influence on Avicenna was already suggested by Pines and corroborated later by Hansberger, *How Aristotle came to believe*, 65-66. The requirement of sleep for all animals in this tradition is also found, for example, in al-Kindī's *De Somno et Visione*, ed. Abū Rīda, 306, 12.

29 Avicenna, *Interpretation of Dreams*, ed. Khan, 280 (my translation); see Lamoreaux, *Early Muslim Tradition*, 70, for this passage; 72-75 for a general dependence on Artemidorus regarding the interpretive part.

*Barhebraeus*

Turning to the Syriac reception of both Aristotle and Avicenna, the similarly corresponding passage in Barhebraeus's as yet unedited *Book on Animals* in his Avicennan *summa*, the *Cream of Wisdom*, reads as follows:<sup>30</sup>

Sixth [theory]. All walking and blooded animals sleep and wake. Many of them have eyelids and close [them]. They also dream (*w-āf ḥālmān*), as, for example, the horse, ox, dog, sheep, and goat. Regarding oviparous animals, the truth of the matter is not clear, yet they do sleep. Fishes and molluscs sleep little (*z'or*). Though they don't have eyelids, their sleep is known by their rest, when they move their tails [only] a little bit. They sleep more at night, some of them underneath rocks, some in the depth of the sea, and some in mud or sand. Rays sleep so soundly that they are oftentimes even captured by hand.

Seventh [theory]. Also insects sleep. They remain without motion then. Therefore, as they do not see at night, they rest. They all have eyes with dim sight and are afraid of the light of a lamp.

Humans [lit., man] dream most among all animals. They do not dream as infants but begin to dream in the fifth or [even] fourth year. Many men and women have never had a dream at all. [Some] people have dreams [only] after being much advanced in age. A Greek (*hellenikos*) says that there are people in Libya who don't dream at all.<sup>31</sup>

Although Barhebraeus presents, in contrast to Avicenna, examples of the Aristotelian animals that may dream, he drops any reference to viviparous quadrupeds and could be understood as allowing for far more animals to dream when compared with Avicenna, namely, depending on whether the group of animals referred to by »they also dream« consists of either all animals that sleep or at least – and this understanding is preferable – those sleeping animals having eyelids that they close. Nonetheless, Barhebraeus is in many instances closer in wording to Aristotle's text than to Avicenna's. Also, he keeps the Aristotelian uncertainty regarding whether oviparous animals dream, which Avicenna had dropped completely. He does not, however, include fishes in this uncertainty, but only comments on the duration, rather than the intensity, of their sleep, which brings him back closer to Aristotle. Therefore, he could even allow for all walking and blooded animals to dream. This would then include walking oviparous animals such as lizards (to take a case not mentioned by Barhebraeus),<sup>32</sup> or at least those walking and blooded animals with eyelids. Even if birds were also partially included as walking animals, they might also be considered able to dream, bearing in mind the doubts about oviparous animals. With regard to the overlapping groups into which birds might fall, Aristotle says that bats can walk and some birds have feet as well, even though they are not of much use.<sup>33</sup> Barhebraeus does not go into further detail here, though, since he classifies animals as walking, flying, and swimming in his *Physics*, this overlap of classifications is probably not intended. (Aristotle's phrase is no less ambiguous, literally, »having feet«.) If, on the other hand, the ability to dream is granted to all animals having eyelids

30 An edition with English translation and determination of the main sources is currently under preparation by Martina Galatello (Roma Tre).

31 Florence, Biblioteca Medicea Laurenziana, orientali 83, fol. 93v; cf. Midyat, Mor Baršawmo Library, 14, 178v (my translation).

32 Being cold-blooded in the modern sense could still allow for being blooded in the Aristotelian sense.

33 Aristotle, *Historia Animalium*, ed. Balme, 487b24; *Arabic Version*, ed. Filius, 114. The Arabic says more clearly that all birds walk, though see also Pellegrin, *Aristotle's Classification of Animals*, 45.

broadly defined, dolphins and whales, for example, might also be included. However, if Barhebraeus considers them fish,<sup>34</sup> which he says do not have eyelids, then they would not be able to dream, since according to him they neither have eyelids nor walk.<sup>35</sup>

A shorter version with a peculiar combination of sleeping and dreaming due to this abridgment is found in Barhebraeus's *Sanctuary Lamp*:

All animals that are quadrupeds and viviparous sleep and dream. Man, however, dreams most, though after the fourth year. A Greek (*hellenikos*) says that there is a tribe in Libya that never has dreams at all.<sup>36</sup>

There is evidence for the existence of an independent, though lost, treatise on dreams by Barhebraeus.<sup>37</sup> If he used the text ascribed to Avicenna as a source for it and included the same generalization of all animals being able to sleep in it (similar to Aristotle's *Parva Naturalia*), the same interpretative struggles between theoretical generality and limited observation could arise. He does, however, deal with veridical dreaming and its causes in at least two places, in the book *On the Soul*, contained within the *Cream of Wisdom*, as well as in the *Sanctuary Lamp*.<sup>38</sup> However, the discussion there only refers to the rational soul and thus does not affect animals, who might, therefore, be considered non-receptive to this kind of dream.

*Excurses: Albert the Great, Pliny the Elder, and Ibn Abī l-Ash'ath*

A similar treatment is found in Albert the Great's *De Animalibus (Animals)*,<sup>39</sup> which is, like Barhebraeus's writing on the subject, primarily influenced by both Aristotle and Avicenna and will be mentioned here briefly only for the sake of comparison. Besides these shared sources, Albert is not only a representative of the Medieval Latin tradition, but also roughly contemporary with Barhebraeus. According to Albert, all walking and blooded animals sleep and wake. Although he opens as Avicenna does by initially allowing other animals to dream, he subsequently limits these perhaps even further than Aristotle's viviparous quadrupeds, since he only speaks of »many« animals, not necessarily implying all of them. Albert also completely drops the mention of at least doubt about oviparous animals being able to dream (which might negate any ability to dream). However, he is similar to Avicenna in extending

34 Aristotle considers them to be cetacea (large marine mammals, especially whales and dolphins) rather than fish; Barhebraeus, however, lists, for example, dolphins with eels among fish when discriminating by the number of gills (Florence, Biblioteca Medicea Laurenziana, orientali 83, 88v); the role of cetacea in Barhebraeus's classification of animals will be dealt with in a forthcoming paper *Fishy dolphins*. Likely, they are implicitly distinguished from fish nonetheless.

35 Whales and dolphins do, in fact, have eyelids, as they are mammals.

36 Barhebraeus, *Sanctuary Lamp*, ed. Çiçek, col. 162 (my translation).

37 Takahashi, *Barhebraeus*, 85, no. 30; there might be one manuscript containing this work or parts of it, *ibid.*, 387, no. B.30. For a Syriac text on dream interpretation, see Furlani, *Une clef des songes*, and Mavroudi, *A Byzantine Book on Dream Interpretation*, 237-240.

38 See the paraphrasing translations in Furlani, *Psicologia*, 49-50 ([26]-[27]), and in his *Barhebreo sull' anima razionale* (pt. 2), 112-113.

39 He does not treat the topic in his *Quaestiones super De Animalibus (Questions on Animals)*.

the Aristotelian example of the barking dog to sounds that other animals might utter when dreaming, though the barking itself is explained not as connected with dreams, but with sleeping. By this change that excludes birds, he would allow for the least number of animals to be able to dream, even fewer than Aristotle. He also posits the absence of any dreaming in children before they reach the Aristotelian age threshold.<sup>40</sup>

Regarding sleeping, however, he seems to immediately extend the group of sleeping animals to include all animals, after beginning by bringing in the Aristotelian walking and blooded animals. The motivation for this subsequent generalization, which does not seem to be based on a manuscript gloss, is not clear.<sup>41</sup> This broadening contrasts with his narrowing of dreaming animals.<sup>42</sup> The sleep of fish and oviparous animals is assumed to be temporally short (*modicum*),<sup>43</sup> without information on its intensity. As with Aristotle, a late onset of dreaming might be connected with approaching the end of one's life. Additionally, however, the absence of dreaming in infants is physiologically explained by an excess of moisture.

It is useful to compare Albert's ideas to an ancient Latin author whose use of Aristotle was prior to any Arabic reception. Pliny the Elder briefly discusses sleep and waking in animals in his *Naturalis Historia* (*Natural History*), 10.97-98.<sup>44</sup>

Here we find the sleep of all land animals having eyelids, the sleep of aquatic animals with a short duration, and the sleep of insects. Unless they are considered land animals, birds are omitted from the list. Having eyelids is given as a reason for sleep, rather than their closure being a means of indicating a period of sleep. Humans sleep most after birth with the duration of sleep shortening afterward. In contrast to Aristotle, infants also immediately dream.<sup>45</sup> Again, some humans do not dream at all; with others, a late occurrence of dreams is a potentially fatal sign. The Aristotelian exemplary animals, namely, horses, dogs, oxen, sheep, and goats, also appear in Pliny's text. Dreaming is granted to all viviparous animals and, with some doubts, also to oviparous animals. Dropping the quadruped requirement for dreaming is a noticeable shift, opposite Avicenna's omission of viviparity but preservation of four-footedness. Pliny would thus consider viviparous snakes, such as the garter snake, to be able to dream, contrary to Avicenna, who would not, supposing that no further distinction between ovoviviparity (which would apply to the snake) and simple viviparity applies here.

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40 Albert, *De Animalibus*, 4.3, trans. Kitchell and Resnick, 1.482-483.

41 It might be due to his treatment of sleep in his *On Sleep and Waking*, where he can be understood as granting all animals the ability to sleep and wake, similar to the case of Aristotle's original treatise; see Donati, *Albert the Great as a commentator*, 177.

42 Albert's *On Sleep and Waking* has a remark about dreaming animals besides humans similar to one of Aristotle in his *De Divinatione per Somnum*. According to this, dreaming animals do not have access to divinatory dreams, but humans do. See Donati, *Dreams and divinatory dreams*, 203.

43 Albert, *De Animalibus*, ed. Stadler, 1.402.

44 Pliny the Elder, *Naturalis Historia*, trans. Bostock and Riley, 2.552-553. This passage was also selected by Seafeld, *Literature and Curiosity of Dreams*, 33-34.

45 As already noted by the translator in Pliny the Elder, *Naturalis Historia*, trans. Bostock and Riley, 553 n. 67. However, one might wonder whether this is influenced by the passage in Aristotle's *De Generatione Animalium* (778b, see above) on infants' immediate onset of sleeping, though not dreaming, and perhaps due to a combination of both Aristotle's *Historia* and *De Generatione Animalium* passages.

In contrast to Aristotelian discussions of animals sleeping and dreaming, there are also other treatments that are not noticeably Aristotelian. The Arabic philosophical writer Ibn Abī l-Ash'ath (d. ca. 970 CE, Iraq), who treats the topic in his *Animals*, was influenced instead by Galen.<sup>46</sup> Due to this, he will be included here for comparison with a representative of a different Arabic tradition. Due to the differing sources and structure, there is no coherent treatment of sleeping and dreaming in the *Animals* as in Aristotle.<sup>47</sup> However, there is, for example, a statement about dogs' sleep, relating it to humoral temperaments: since their brain is cold, they sleep much, but since it is also dry, their sleep is not deep, producing heavy breathing and evil dreams.<sup>48</sup> This is roughly similar to Aristotle's barking dog.<sup>49</sup>

The Egyptian zoographical writer al-Waṭwāt (late twelfth to early thirteenth century CE) frequently reuses Ibn Abī l-Ash'ath's text, directly and without ascription as well as indirectly in his *Pleasures of Thoughts (Mabāhij al-fīkar wa-manāhij al-ibar)*.<sup>50</sup> According to him, to dream and to have dream visions is said to be in the dog's nature.<sup>51</sup> Also, the dog's lightness (*khiffa*) of sleep leads to being attentive during sleep and to not fully closing the eyelid.<sup>52</sup> This contrasts with what Aristotle says about all animals with eyelids closing them during sleep and about dogs moving due to dreaming. The reason for the lightness, however, is the dog's brain being colder than that of a human.<sup>53</sup> (Ibn Abī l-Ash'ath's reason was the brain's dryness relative to humans.<sup>54</sup>) In addition, horses are said to dream like humans,<sup>55</sup> and hares to sleep with open eyes.<sup>56</sup>

46 Kruk, Ibn Abī l-Ash'ath's *Kitāb al-Ḥayawān*, 126.

47 However, he also wrote an *Epistle on Sleeping and Waking* that is preserved in at least one manuscript (see Sezgin, *Geschichte des arabischen Schrifttums*, 3.302 and Ibn Abī Uṣaybi'a, *'Uyūn al-anbā' fī ṭabaqāt al-aṭibbā'*, ed. and trans. Savage-Smith *et al.*, 10.46.4, no. 14). An edition of this text, which is not concerned with animals at all, is forthcoming. It is by content primarily dependent on Galen.

48 Ibn Abī l-Ash'ath, *Animals*, ed. al-Ḥarbī, 245, trans. Kruk, Ibn Abī l-Ash'ath's *Kitāb al-Ḥayawān*, 144. An overview of scattered Galenic passages on temperaments and their relation to sleep has been given by Hulskamp, *Sleep and Dreams*.

49 This might indicate that he used Aristotle's *Historia*, at least in an indirect manner. Ibn Abī l-Ash'ath, however, has reduced Aristotle's neutral dreaming of the dog as indicated by barking during sleep to something negative: evil dreams accompanied by heavy breathing. Galen discusses a connection between dryness and humors in the stomach with dreams; see Hulskamp, *Value of dream diagnosis*, 64-65.

50 As has been noted by Kruk, Ibn Abī l-Ash'ath's *Kitāb al-Ḥayawān*, 161; see also Schmitt, *Always by your side*, 23-24, for a direct case.

51 Al-Waṭwāt, *Mabāhij al-fīkar*, ed. al-Ḥarbī, 185.

52 Al-Waṭwāt, *Mabāhij al-fīkar*, ed. al-Ḥarbī, 186-187.

53 Al-Waṭwāt, *Mabāhij al-fīkar*, ed. al-Ḥarbī, 187.

54 Ibn Abī l-Ash'ath, *Animals*, ed. al-Ḥarbī, 245. This is not necessarily faulty, as Galen, *On Mixtures*, trans. Singer and van den Eijk, 72, uses the example of the dog for illustrating the relativity of qualities (dry in relation to a human, though wet to an ant, hot to a human, but also cold to a lion).

55 *Mabāhij al-fīkar*, ed. al-Ḥarbī, 299. This Aristotelian thought might derive from Timothy of Gaza's *Animals*, trans. Bodenheimer and Rabinowitz, 34. Dreaming horses, though, are not mentioned by Ibn Abī l-Ash'ath in his discussion of horses in *Animals*.

56 Al-Waṭwāt, *Mabāhij al-fīkar*, ed. al-Ḥarbī, 282. As they are mammals, and thus have eyelids, this would be in contrast with Aristotle. However, he gives as a reason peculiarities of their bones, that is, the circumorbital rings. This statement is found in the same manner also in al-Nuwayrī's *Nihāyat al-arab*, ed. Qamiḥa, 9.205.

Roughly, this yields to the following:

	Aristotle	Avicenna	Barhebraeus, <i>Animals</i>	Barhebraeus, <i>Sanctuary Lamp</i>	Albert the Great	Pliny the Elder	Ibn Abi al-Ash'ath	Al-Watwāt
Animals that sleep and wake	Walking and blooded; ovipara, aquatic animals, insects	Walking and blooded; ovipara, aquatic animals, insects	Walking and blooded, ovipara, fishes, insects	Viviparous quadrupeds	Walking and blooded, but also: all animals Further: ovipara, aquatic animals, insects	Land animals with eyelids, aquatic animals, insects, ovipara		
Animal eyelids	Closed when sleeping	Closed when sleeping	[Among blooded and walking animals] Closed when sleeping		Closed when sleeping	Indicate sleep in land animals		
Animals that dream	Viviparous quadrupeds	Others besides humans	Blooded and walking animals with eyelids (?) (examples: horse, ox, dog, sheep, goat)	Viviparous quadrupeds	Many animals besides humans (horse, bull, goat, dog, many other viviparous quadrupeds)	Besides humans Obvious: horse, dog, ox, sheep, goat Supposed: viviparous	Mentioned regarding dogs (evil dreams)	Mentioned regarding dogs and horses
Onset of dreaming in humans	4-5	4 (earlier not considered dreaming)	4-5	4	4-5	Immediate		
Significance of late dreaming onset in humans	Indicates physical changes				Indicates physical changes, fatal sign	Fatal sign		

### *Situating Barhebraeus among the Authors*

So far for the reception of Aristotelian (and Galenic) lore in differing traditions. It seems, based on this comparison, that Barhebraeus has not just simplified the range of animals that are able to dream, but deliberately broadened it. If simplification were his main concern, he could have easily dropped the Aristotelian examples as well as the discussion about the sleep of fish and their hiding places. This broadening in general is perhaps due to Avicenna's version. However, if the mammalian trait of having eyelids is Barhebraeus's distinguishing criterion for being able to dream, then the discussion has undergone something like a »mammalization«. On the other hand, since Barhebraeus still sticks to Aristotle's exemplary animals, it is also possible, but less likely, that he approves the criterion of being a viviparous quadruped without expressly mentioning it, as he does mention walking and blooded animals in the opening lines and could have easily referred to viviparous quadrupeds as well.

The significant shift from short sleep in the Greek Aristotle to light sleep in Avicenna is explicable by the extant Arabic translation of Aristotle.<sup>57</sup>

If taken at face value, however, the short version in the *Sanctuary Lamp* could be limiting even sleeping to viviparous quadrupeds only. Also, the onset of human dreaming is already at the age of four, as in Avicenna (unless one were to read the sentence as humans surpassing all other animals in dreaming after the age of four, despite perhaps already dreaming earlier, yet to a lesser degree; this, though, is not the most likely understanding of this sentence).

Dreaming, if understood in modern terms as showing certain brain activation or rapid eye movement (REM) phases in sleep, is indeed attested for many mammals as well as non-mammals.<sup>58</sup> However, it is suggested that dreaming also occurs during non-REM phases of sleep.<sup>59</sup>

What is the logic behind the above authors' taxonomies of dreaming animals? Even though they do not discuss this in detail, one wonders whether Aristotle and later authors assume a loose, general connection between intellectual capacities and the ability to dream or the frequency of dreaming.<sup>60</sup> That humans are said to dream most may refer to either the frequency or the length of their respective dream period during sleep. Also, the other animals that are

57 See note 8 above. In traditional modern sleep research, Kleitman, *Sleep and Wakefulness*, 108-113, lists several ways to investigate the depth of sleep, all of which usually focus on one variable, such as the loudness of a certain sound needed to awaken a sleeping person. It has also been proposed to take both depth and duration into account by forming a product of both.

58 See Hobson, *Dreaming*, 51-52, and Kleitman, *Sleep and Wakefulness*, 102-103; Gallop, *Aristotle: On Sleep and Dreams*, 35-38, also lists cases of non-mammals. Karmanova and Oganessian, *Sleep*, 7-12, see in the extended periods of motionless rest of fish an early evolutionary state of sleeping, which allows them to remain undetected by potential predators.

59 Hobson, *Dreaming*, 38-39.

60 Tertullian, *De Anima*, 49, ed. Waszink, 67 (see the commentary, 514-518), understood Herodotus's remark on the non-dreaming Libyan tribe as an unfavorable characterization. Historically, Dendy, *Philosophy of Mystery*, 274, assumed the ability to dream among some quadrupeds with higher intellectual powers, while Macnish, *Philosophy of Sleep*, 46, saw a general connection between an animal's intellectual capacities and its proneness to dream. However, Gallop, *Aristotle: On Sleep and Dreams*, 35, notes that there is no connection between the onset of dreaming or its absence and intellectual performance. This topic is connected with the question of whether dreaming serves any purpose at all according to Aristotle, which has recently been affirmed by Segev, Teleological significance, based on the usefulness of both bodily and intellectual »residues« (a concept used in Aristotle's biological works) for animals. A summary of several modern assumptions is given by Hobson, *Dreaming*, 77-79.

expressly mentioned as dreaming could perhaps be considered animals with higher mental abilities, unless they are understood as just those that are observed daily. However, humans' superior dreaming cannot be explained by their sense impressions lasting longer, since the acuteness of most animal senses besides touch surpasses that of humans according to Aristotle, and this is subsequently affirmed by Avicenna and Barhebraeus. Thus, the difference would perhaps be the inner senses' handling of these impressions.

A remaining problem in the relationship between intellectual capacity and dreaming is why smaller children are thought not to dream at all rather than just less frequently. Were they considered to be not yet fully rationally humans? Yet the presence of the rational soul should not be necessary for dreaming, since it is not present in animals, not even those that dream. That Avicenna alone among these authors allows a dream-like state among young children (in place of dreaming proper) relates to this. Nonetheless, the Aristotelian age limit also has some empirical evidence.<sup>61</sup> In fact, the other authors deny any actual dreaming at all, not just the infant's ability to recall a dream and report its contents.<sup>62</sup> The latter would require a certain level of rationality but would not be a necessary condition of dreaming itself. Since animals cannot report their dreams either, it must be the case that authors relied on behavior observed during sleep for their theories about dreaming.

In spite of these problems, a general connection between intellectual abilities and dreaming could be upheld in light of the way Aristotle explains bodily hindrances as being responsible for children and some adults not dreaming, as given at the very end of *De Insomniis* (462b).<sup>63</sup> The animal soul would nevertheless be sufficient for dreaming.<sup>64</sup> However, this comes with some uncertainty, as certain authors omit Aristotelian passages that could help interpret them.

#### *Assessment of Barhebraeus's Sources*

So far, Barhebraeus's identifiable primary sources for the *Book on Animals* are Aristotle and Avicenna,<sup>65</sup> besides an assumed third one of Greek origin regarding the report on a non-dreaming tribe in Libya. Even though this report is found in Herodotus,<sup>66</sup> it is unlikely that Barhebraeus used this source directly. Rather, he might have drawn from a *scholion* (especially as the citation is merely ascribed to a *hellenikos*, »Greek«) or from some other text with ancient roots.<sup>67</sup>

61 Hobson, *Dreaming*, 66; see also Kleitman, *Sleep and Wakefulness*, 102.

62 See Papachristou, Aristotle's theory of »sleep and dreams«, 16 n. 77, on Aristotle raising the question in *De Somno et Vigilia*, 453b18-20, of whether every human dreams even though some are unable to recall their dreams. See also Dentan, *Ethnographic considerations*, 319, for cultural barriers hindering a dreamer's truthful rendering of a dream's content to the person recording it.

63 Referring also to Aristotle, *De Insomniis*, 461a8-25, where an excess in heat due to food is responsible for non-dreaming.

64 Aristotle, *De Insomniis*, 459a.

65 Generally, usage of Avicenna's *Animals* is seen in the structure and the section headings, even though the case is less clear regarding the part on sleeping and dreaming considered here. For the afterlife of Aristotle's text in Syriac, see now also Hugonnard-Roche, *Les Livres sur les animaux d'Aristote*.

66 Herodotus, *Histories*, 4.184.4; see also Liverani, *The Libyan caravan road*.

67 The name Herodotus appears near the relevant text in the *Sanctuary Lamp* (ed. Çiçek, col. 162), so it cannot be the case that it was anonymized intentionally.

The usage of other ancient, late antique, or Byzantine texts in translation is currently unclear. Two texts of Nicolaus Damascenus in particular, *Plants* and his *Compendium*, were used by Barhebraeus in some works, the latter especially in the *Meteorology*, as noted by the respective editors.<sup>68</sup> Though the extant portions of the *Compendium* do not include Aristotle's biological works, Barhebraeus might nonetheless have had a complete version at his disposal for this particular passage. He does not, at least according to a first impression, seem to have made use of some of the older Syriac and Arabic texts that could have been available to him.<sup>69</sup>

The similarity between Barhebraeus's text and the Greek text of Aristotle regarding the depth of sleep, departing from the extant Arabic translation and Avicenna on this point – that is, short rather than light sleep – might indicate that the translation at Barhebraeus's disposal of Aristotle's *Historia* or, rather, *Animals* as a single book in the Arabic tradition was not the extant one, but one closer to the Greek.<sup>70</sup>

Rather, what is at first sight peculiar in Barhebraeus's *Book on Animals* is the unexpected absence of post-Avicennan philosophical sources, in contrast to his extensive use of these in most of his other works, especially the works that make up the *Cream of Wisdom*. For instead of Avicenna himself, whose texts he used to a lesser degree, Barhebraeus is frequently indebted to Fakhr al-Dīn al-Rāzī (d. 1209 CE, not to be confused with the earlier Abū Bakr Muḥammad b. Zakariyyā' al-Rāzī), Naṣīr al-Dīn al-Ṭūsī, Abū l-Barakāt al-Baghdādī, al-Abhari, Ibn Kammūna, and, at least in one instance, even al-Suhrawardī.<sup>71</sup>

68 For example, in his *Plants* (ed. Drossaart Lulofs and Poortman, 35-36), Barhebraeus made use of a Syriac version of the *Compendium* of Aristotle's philosophy by Nicolaus Damascenus and did so also in the *Meteorology*, in combination with Olympiodorus, as shown by Takahashi. (Whether the *Plants* was an independent work by Nicolaus besides the summary in the *Compendium* is not fully clear, see Takahashi, Nicolaus of Damascus). However, there is no part of Aristotle's *Historia Animalium* in the extant parts of Nicolaus's *Compendium* (partial ed. and trans. Drossaart Lulofs; a complete Syriac edition is being prepared by Takahashi). However, in his Aristotle, Bar Hebraeus, and Nicolaus Damascenus on animals, 345-357, 353, Drossaart Lulofs suggests Barhebraeus used the *Compendium* in the zoological part of his *Lantern* (his short citations do not seem to require the use of Aristotle directly). Barhebraeus probably did not have sufficient knowledge of Greek to directly access Greek texts. In other instances, such as in his biblical commentary, »in the Greek«, etc., refers to Syriac versions of Greek texts, such as of the *Septuagint*. However, the Arabic zoographer al-Marwazī introduces some of his citations of Timothy of Gaza by similarly referring to »the Greek«, as noticed by Kruk (Timotheus of Gaza's *On Animals*, 376-377), who also assumes some of al-Marwazī's source texts were Syriac (360). Yet this obviously does not seem to require a usage of Timothy in this regard by Barhebraeus, as the places in al-Marwazī refer to certain animal species.

69 Such as, at least according to first soundings, Job of Edessa's *Book of Treasures*, ed. and trans. Mingana, 70-71, where the true sleep of humans is distinguished from animal sleep that only resembles sleep (I am indebted to Michael Payne for drawing my attention to this passage); the Syriac *Book on Natural Things* (a work in the *Physiologus* tradition containing a bestiary that has been identified as a limited partial source in the *Sanctuary Lamp* by Bakoš, Quellenanalyse der Zoologie, 270); or further Arabic zoographical literature, such as, for example, al-Jāhīz, Ibn Abī l-Ash'ath, or al-Marwazī. This also applies to »Western« texts on animals, for example, by Ibn Rushd (Averroes) or Ibn Bājja, which might not have been easily available to him.

70 See also my forthcoming article Touchy animals for a further instance of that in the *Animals*. Similar observations have been made, for example, by Watt for Barhebraeus's *Rhetoric*, 24, regarding Greek loanwords. Drossaart Lulofs, however, as mentioned above, assumes usage of Aristotle by means of Nicolaus's *Compendium* only (Drossaart Lulofs, Aristotle, Bar Hebraeus, and Nicolaus Damascenus on animals). This, in principle, could explain both the deviation from Aristotle as well as the Herodotian addition, yet the lengthy and detailed parallel with Aristotle might suggest he additionally used a translation, for the extant parts of the *Compendium* are quite brief on each section.

71 This applies for the former authors, for example, to the *Physics*, while al-Suhrawardī seems to have been used at least in the *Tractate* for the distinction between essence and existence, which will be addressed in a forthcoming paper.

In addition to incorporating these texts, Barhebraeus was, as is well known, personally acquainted with many Muslim scholars, especially at Maragha, and there in particular with Naṣīr al-Dīn al-Ṭūsī, which is suggested by reports in his Syriac *Chronicle*.<sup>72</sup> The circle of the Maragha observatory might also have influenced his own astronomical works. Recently, Roggema also wondered about a possible personal encounter with Ibn Kammūna,<sup>73</sup> an author whose texts Barhebraeus also uses in his *Physics*. In addition to that, he also prepared a translation of al-Abharī's *Zubdat al-asrār* (the title of which might have influenced that of his own *Cream of Wisdom*). Brentjes suggested al-Abharī was possibly a classmate of Barhebraeus.<sup>74</sup> He is also well aware of many post-Avicennan philosophers' scholarly dependencies.<sup>75</sup>

Thus, as an initial hypothesis, the absence of post-Avicennan source texts in Barhebraeus's *Book of Animals*, in contrast to many of his other works, might perhaps be explained by a shift in the philosophical curriculum away from biological works after Avicenna.<sup>76</sup> Reliable information about such a shift is sparse, however. What can be observed, for example, is that some philosophical texts joined those read in the more theological teaching at the *madāris* (sg. *madrassa*).<sup>77</sup> Nonetheless, medical works, especially Avicenna's *Qānūn (Canon)*, continued to be studied, primarily at medical academies, such as hospitals,<sup>78</sup> but also at medical *madāris*.<sup>79</sup>

Most of Barhebraeus's post-Avicennan philosophical source texts are also in the form of Avicennan *summae*, which do not usually comprise the biological or at least animal themes as found in Avicenna's *Book of Healing*.<sup>80</sup> Where later philosophical authors treated topics related to the natural sciences, however, Barhebraeus did indeed make use of these. One example is Fakhr al-Dīn al-Rāzī's treatment of meteorology in the *Eastern Investigations*, which Barhebraeus drew from for his own *Meteorology*.<sup>81</sup>

That is, as a preliminary conjecture, Barhebraeus used the available texts on the topic, which in this case were older ones only due to an absence of contemporary texts. This explanation is roughly the converse of Rassi's recent suggestion about Bar Shakkō, another representative of the Syriac Renaissance. The latter generally relied on both Syriac and Arabic logical texts, but employed recent Arabic ones only in those cases where no Syriac text was

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72 See his Preface to the work in Barhebraeus, *Chronicon Syriacum*, ed. and trans. Budge, 1.2. The acquaintance is further suggested by manuscript notes, see Takahashi, Barhebraeus: Gregory Abū al-Faraj.

73 Roggema, Ibn Kammūna's and Ibn al-'Ibrī's responses.

74 Brentjes, *Teaching and Learning*, 104.

75 See also Endress's graphical rendition in his Reading Avicenna, based on Barhebraeus's reports in his Arabic *Chronicle*.

76 Kruk, Ibn Sīnā on animals, 325, discusses possible reasons why Avicenna himself left the zoological part until last in writing his *Book of Healing*.

77 See Eichner, *Post-Avicennian Philosophical Tradition*, 419, for changes already made by Bahmanyār; see also Endress, Reading Avicenna; and Makdisi, *Rise of Colleges*, 250. However, Brentjes, *Teaching and Learning*, 71, suggests that natural sciences were also taught.

78 Makdisi, *Rise of Colleges*, 27; Brentjes, *Teaching and Learning*, 115-131.

79 Brentjes, *Teaching and Learning*, 91-98.

80 However, Brentjes, *Teaching and Learning*, 76, 148, 208, and 210, has some information on later teaching about animals.

81 See the Index Loc. in Takahashi's edition.

available.<sup>82</sup> Barhebraeus's selection would, at first sight, point to the opposite case here, namely, taking recourse to Syriac or older Arabic texts only in cases where no contemporary Arabic versions were available. In addition, he perhaps focused intentionally on certain philosophical authors of the Islamic East (primarily, those mentioned above, some of whom he knew personally) who were not very interested in biological themes.

Indeed, where one of his often cited authors, Naṣīr al-Dīn al-Ṭūsī, does deal with the Aristotelian scale of nature – though in his *Nasirean Ethics* (a work that Barhebraeus made use of in his own *Ethics* in the *Cream of Wisdom*) rather than in a biological work – Barhebraeus renders this particular passage into Syriac as well.<sup>83</sup> Even though he does not seem to have included it in his *Book on Animals*, his use of it would still support the above hypothesis that he used recent works where available.

Yet this basic conjecture fails as a general explanation, since there are two clear counter-examples to be found in his treatments of physiognomics. Even though Avicenna does not dedicate an independent treatise to physiognomics, Barhebraeus discusses it in his practical philosophy in the *Cream of Wisdom*, namely, in his book *Economics*. As Furlani suggested and Zonta and Joosse (in his edition of the Syriac text) later corroborated,<sup>84</sup> Barhebraeus likely made use of a Syriac version of Polemon's text on physiognomics. However, in this case, an independent Arabic treatise on physiognomics by Fakhr al-Dīn al-Rāzī, one of Barhebraeus's frequently used source authors of the post-Avicennan period, is indeed extant.<sup>85</sup> Therefore, one would, according to the abovementioned hypothesis, expect Barhebraeus to have made use of it instead of Polemon's older text, or at least in addition to it. Yet this does not seem to be the case. Rather, he even cites the names of ancient persons as they are found in Polemon. Neither from the structure of the section in Barhebraeus nor by its content is there any clear indication that he drew on Fakhr al-Dīn al-Rāzī's text on physiognomics. A similar situation is also found regarding the short chapter on physiognomics in Barhebraeus's *Amusing Stories*.<sup>86</sup> Even though Marzolph traced most other passages of this work by Barhebraeus to Abū Sa'd al-Abī's Arabic anthology *Scattered Pearls* (*Nathr al-durr*),<sup>87</sup> there is no parallel for the physiognomical part.<sup>88</sup> Weitz, however, later found some parallels with the pseudo-Aristotelian work *Physiognomics*.<sup>89</sup> But again, there is not much in common with al-Rāzī's text.

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82 Rassi, *From Greco-Syrian to Syro-Arabic thought*, 359.

83 Barhebraeus, *Ethics* 1.3.3, ed. and trans. Joosse, 22-23.

84 Furlani, *A short physiognomic treatise*, 289; Barhebraeus, *Ethics*, ed. and trans. Joosse, 8-9; *idem*, ch. 3, ed. and trans. Joosse, 118-131; Zonta, *Fonti greche e orientali*.

85 Fakhr al-Dīn al-Rāzī, *Kitāb al-firāsa*, ed. Mourad.

86 Ch. 20.

87 Also known as *Prose Pearls*.

88 Marzolph, *Die Quelle der Ergötzlichen Erzählungen*, 111. The chapter on physiognomics is the final one in Barhebraeus's work, following a chapter on dreams and their interpretation (though without taking animals into account, except for their appearance in dreams).

89 Weitz, *Al-Ghazālī, Bar Hebraeus, and the »good wife«*, 213 n. 43. Barhebraeus indeed even mentions Aristotle by name here. An additional parallel is also found in his list of different peoples.

Three possible explanations arise for this. First, Barhebraeus might not have been aware of al-Rāzī's text due to limited availability, whether because too few manuscript copies were circulating or because it was not in the libraries Barhebraeus had access to.<sup>90</sup> In this case, the initial hypothesis could be upheld in a modified form (if no such texts were extant or at least were not available to Barhebraeus). Second, Barhebraeus might have been aware of this text, but intentionally refrained from using it in favor of Polemon's text or the pseudo-Aristotelian one, for example, because the latter were more renowned. This would be against the initial hypothesis and at odds with many other instances. A deliberate neglect due to concerns regarding the content is not likely, either, as al-Rāzī even opens in a very structured manner and would have been suited for similar concise approaches by Barhebraeus. In addition, Barhebraeus incorporates pieces and examples elsewhere even when he does not agree with the author's main thesis. Third, an exception could be conceded if Barhebraeus considered this work spurious, not trusting the ascription to al-Rāzī,<sup>91</sup> or if he did not know its authorship (for example, because the manuscript did not mention it, although Barhebraeus showed with the statement about dreaming in Libya mentioned earlier that he was willing to include sources anonymously).<sup>92</sup>

### Conclusion

To sum up briefly, Barhebraeus and possibly also Avicenna (though less explicitly) allow for more animals to be able to dream than Aristotle does, namely, perhaps all animals having eyelids or even all animals in general. Otherwise, if it is all walking and blooded animals that are intended, then they may have implicitly added oviparous quadrupeds to Aristotle's dreaming animals, which constituted, at least without doubt, viviparous quadrupeds only. They may also have accepted birds as dreamers, either with some doubts or in the category of walking animals.

Despite having abbreviated and systematized the material that he combined out of at least two sources identified so far, namely, Aristotle's *Historia Animalium* (either an older Arabic or a Syriac translation) and Avicenna's *Animals* from the *Book of Healing*, Barhebraeus seems to have made these alterations to the categories of dreaming animals intentionally.

That he took recourse to older authors, skipping contemporary post-Avicennan philosophers, cannot be explained solely by the fact that his favorite authors, philosophers of the Islamic East, partially omitted biological themes. It may also be that Barhebraeus still focused on the Aristotelian or Avicennan curriculum of science, while his contemporaries shifted their focus, for example, to logic and ontology (often within a theological context), a change that might have begun right after Avicenna. If there were more zoological texts by his preferred authors, he would likely have relied primarily on these instead of having recourse to older ones.<sup>93</sup> Yet this supposition surely cannot be generalized, as the two treatments of physiognomics signify. The most likely explanation for these cases, though, is his unawareness of the respective texts.

90 Mourad, *La physiognomie arabe*, 69-70, based his edition on three different manuscripts.

91 However, since Ibn Abī Uṣaybi'a mentions the work among al-Rāzī's output (*Uyūn al-anbā' fī ṭabaqāt al-aṭibbā'*, ed. and trans. Savage-Smith *et al.*, 11.19.7 [ed. 2-2.880, trans. 3-2.979, but note 2.2.880 n. 118, on some manuscripts omitting this title from the list], though as the very last item in the list, no. 67, see also Mourad, *La physiognomie arabe*, 69), it is perhaps unlikely that Barhebraeus did not know its authorship.

92 Of the three manuscripts Mourad had access to, he mentions that the Cambridge one does not bear the author's name (*La physiognomie arabe*, 69).

93 However, there would not likely have been an impact on the Latin tradition as these authors did not stand in the focus of Latin translations. That is, even if there were texts, they probably would not have been translated, as other texts by these authors most often have not, either.

*Acknowledgments*

This project received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program (grant agreement no. 786762).

Peter Adamson and Nathan Gibson gave valuable feedback on earlier draft versions, as did two anonymous readers as well as members of the audience at the virtual forum, among them Pavel Basharin, Florian Jäckel, Salam Rassi, Hidemi Takahashi, and Barbara Jockers.

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