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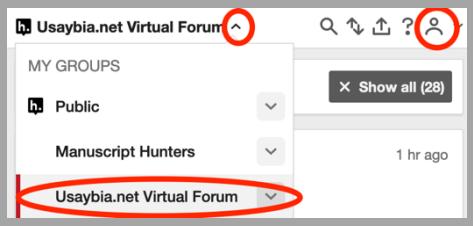

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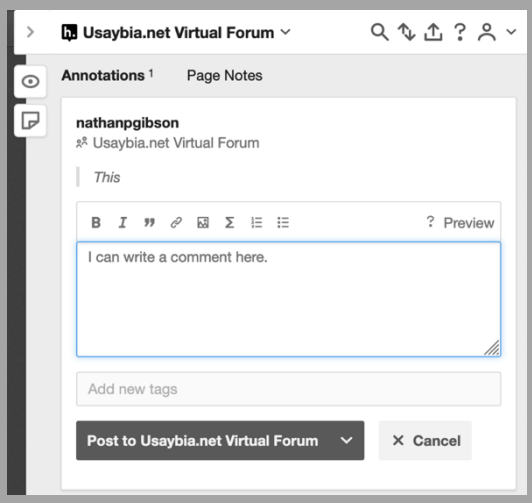

Sleepy Animals. Barhebraeus (1226-1286) on Sleeping and Dreaming among Animals [Draft Version]

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Abstract

This paper endeavors to look into the question which animals are considered as sleeping in general and which of those are in addition also being able to dream according to Barhebraeus (1226-1286), the famous Syrian Orthodox polymath and theologian. Attention will also being paid to his primary source authors here, namely, Avicenna and Aristotle, as well as to Albert the Great as another dependent author. Avicenna and Barhebraeus turn out to allow for far more animals to dream than Aristotle himself did explicitly, while Albert allows for even less. Lastly, the question why Barhebraeus primarily relied on these two authors as his sources, though not other post-Avicennan authors, as he did frequently in most of his other philosophical and even theological works, will be briefly discussed.

Introduction

According to Aristotle's *History of Animals*, iv.10, all footed (that is, walking) and blooded animals sleep and wake, those with eyelids additionally close them while sleeping. Man and viviparous quadrupeds are also able to dream, which he illustrates by horses, dogs, oxen, sheep, and goats. While Aristotle is unsure about oviparous animals' ability to dream, man, nonetheless, dreams most, with the exception of children. However, these oviparous animals as well as insects and marine animals have at least some sort of sleeping and waking.

[tr. Peck, Cambridge/MA, 1970, 83-89] Sleeping and waking in animals. All animals that are footed and blooded sleep and wake: this is plain to observation. Thus, all animals that have eyelids close them when they go to sleep. Furthermore, it appears that not only men, but horses, dogs and oxen, dream, indeed sheep too, and goats and the whole group of viviparous quadrupeds. Dogs betray the fact by barking while asleep. As for the Ovipara, it is not clear whether they dream, but it is obvious that they sleep. Similarly with the water-animals, such as fish, and the Cephalopods, and the Crustacea (crayfish and the like). All these animals, no doubt, do not spend much time asleep, but that they sleep is plain. No indication of it can be obtained from their eyes, because none of them has any eyelids: it is shown by the periods when they remain motionless [...] Thus, it is often possible to approach fishes unawares so that one can catch them in the hand, or to strike them unawares; during that time they are perfectly still and make only a slight movement of the tail. It also becomes quite obvious that they sleep from the way they start off if any disturbance occurs while they are resting: they start as though suddenly wakened from sleep. Furthermore, fish are caught by torchlight, and this happens because they are asleep. [...] In general, fishes sleep close to the earth or to the sand or to some stone, on the bottom, or else in a hide-away under some rock or sandbank. Flat fish sleep in the sand: you can tell them by their outline in the sand; they are called by a stroke with a three-pronged instrument. [...] The Selachia sometimes sleep so soundly that they can actually be caught by hand. The dolphin and the whale and all that have a blowhole sleep with their blowhole protruding from the surface of the water, and through it they breathe while gently moving their fins. [...] That insects also sleep is plain from the following indications: they can be clearly seen resting and motionless. This is most evident in the case of bees: they remain quiet at night and cease their buzzing. The fact is also plain to see in the commonest of such creatures: not only do they remain quiet at night because their vision is poor (all hard-eyed animals have indistinct vision), but even when exposed to the light of lamps they are clearly seen to be at rest none the less.

The animal which dreams most of all is man. Children and infants do not dream at all; but dreaming begins in most cases about the age of four or five. Instances have been known of full-grown men and women who have never had a dream in their lives. Some people of this sort have in fact come to dream later in life, and this has been followed by some physical change, resulting in death for some and debility for others.

We have now described sensation, and sleep and awaking.

However, there are at least two further statements within the *Parva Naturalia* corpus that could be understood as allowing for more animals to dream than in the *History*. In *On Dreams* (461a26), he speaks of dreaming in blooded animals generally, where the blood is responsible for the persistence of sense-images.

[tr. Hett, Cambridge, MA, 1957, 363-365] In animals that have blood, as the blood becomes quiet and its purer elements separate, the persistence of the sensory stimulus derived from each of the sense organs makes the dreams healthy, and causes an image to appear, and the dreamer to think, because of the data supplied from the organs of sight and hearing, that he really sees and hears.

In *On Prophecy in Sleep* (463b12), he states that "some of the other animals" (*tôn allôn*) do dream, and, therefore, dreams cannot be sent by God.

[tr. Hett, 379] Generally speaking, since some of the lower animals also dream, dreams cannot be sent by God, nor is this the purpose of their appearance, but they have a divine origin; for nature is divinely ordained, though not itself divine.

Hett translates in this context as "lower animals." The contrast, however, seems to be with man generally. Then, Aristotle would intend that some animals besides man do also dream. However, assuming the *History* passage to be more elaborate and therefore to be upheld, the *Parva Naturalia* parts should be understood as not allowing for more animals to dream besides viviparous quadrupeds and, perhaps, oviparous animals, but, rather, as being formulated loosely.

Similarly to the treatment in Aristotle's *History*, the topic is also covered in Avicenna's *Book on Animals* of his *summa Healing*. The general title "Animals" is a reference to the Arabic tradition that combines the *History of Animals*, *Parts*, and *Generation* into one single book.[1] Avicenna gives the following on sleeping, waking, and dreaming:

[ed. Muntaṣir/Zāyyid/Ismāʿīl, Cairo, 1970, 64-65] With regard to sleeping of animals, all blooded walking animals sleep and wake. All having an eyelid close it during sleeping. Also others besides man dream. This is obvious among quadrupeds from their characters, motions, and voices during sleeping. The sleep of oviparous animals is light, not deep. And similarly with the crustacea (*layyin al-khazaf*),[2] even though their sleep is not obvious by their eyes, as their eyes don't have hair. Rather, their sleep is sensed by their tranquillity and [by the fact] that they may sometimes be caught by the hand while they are inattentive or that they get hit by an arrow with three bent spikes. 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 duct of rocks at the shore (*shaṭṭiyya*). 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 an arrow. The ray (*salāsī*)[3] might sometimes be sunk into sleep so that it will be caught by hand. The dolphin sleeps while its pipe-duct is protruding and it breathes through it. Its snore is heard while it sleeps.
Insects also sleep. Their rest and quietness signifies this. A juvenile person doesn't dream in a way considered as such until [reaching the age of] four years. Some men don't dream until they get older, though some don't dream at all.

While Avicenna follows Aristotle in keeping the requirement of bloodedness and having feet or walkability for sleeping and waking as well as the inclusion of other animals such as marine animals, insects, and oviparous animals for at least lighter forms of sleep and waking, the case of dreaming is only said to be *obvious* for quadrupeds, though, at least according to the letter,

[1] The other biological treatises such as the *Movement* are not attested in Arabic, though their title is in some instances mentioned, see Kruk's Introduction in Filius (ed.), *The Arabic Version of Aristotle's Historia Animalium*. The *Parva* texts have been freely translated into Arabic (see Hansberger, who is preparing an edition), though so far don't seem to have influenced Avicenna here.
[2] *Malakostraka*, cf. Filius (ed.), Glossary, s.v.
[3] Filius (ed.), Glossary.

not necessarily limited to them, and being viviparous has been dropped as a requirement at all. Rather, he seems to have combined Aristotle's primary group of dreaming animals with the example of the dreaming dog.[4] Therefore, Avicenna could be understood as allowing for more animals than Aristotle to dream, with quadrupeds only being the most obvious case. He also speaks of a light sleep of oviparous animals, though omits Aristotle's doubts as to whether they might be able to dream at all.

Turning to the Syriac reception, the similar corresponding passage in Barhebraeus's inedited[5] *Book on Animals* of his Avicennan *summa Cream of Wisdom* reads as follows:

[ms. Florence, Laurenziana, ms. orientali 83, 93v, cf. Midyat 14, 178v]: Sixth [theory]. All walking and blooded animals sleep and wake. Many of them have eyelids and are closing [them]. They are also dreaming, as, for example, 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, 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, some in mud or sand. Rays sleep so tightly that they are oftentimes also captured by hand.

Seventh [theory]. Also insects sleep. They remain without motion then. Therefore, as they don't see at night, they're resting. They all have eyes of dim sight and are afraid of the light of a lamp.
Man dreams most among all animals. He doesn't dream when he is an infant, but begins to dream in the fifth or [even] fourth year. Many men and women have never had (lit., seen) a dream at all. [Some] people have dreams [only] after having advanced much in age. The Greek (Hellenikos) says that there are people in Libya who don't dream at all.

Although Barhebraeus presents, in contrast to Avicenna, the Aristotelian exemplary animals that may dream, he drops any reference to viviparous quadrupeds at all and could be understood as allowing for far more animals to dream when compared with Avicenna, namely, either all 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 to Aristotle's text in wording than to Avicenna's. Besides Aristotle and Avicenna, he must have used at least a third source here, as the report on a non-dreaming tribe in Libya is found in Herodotus,[6] though a direct usage is unlikely. Rather, this might be by a scholion (especially as the citation is just ascribed to a "hellenikos") or some other text with ancient roots.[7] However, he keeps the Aristotelian uncertainty regarding the dreaming of oviparous animals that Avicenna had dropped, though doesn't include fishes in this uncertainty, but only comments on the intensity of their sleeping. Therefore, he could allow for up to all walking and blooded animals to dream, including then walking oviparous animals such as, as a test case, lizards,[8] or at least those walking and blooded animals with eyelids. Even if birds were also partially included in walking

[4] The barking of a dog during sleep has been put into question by Windt, *Dreaming*, Cambridge, MA, 2015, 45; Gallop translates rather as "whining."
[5] An edition is currently under preparation by Martina Galatello (ÖAW, Vienna).
[6] Bk iv. See also Liverani, "The Libyan Caravan Road in Herodotus IV.181-185,"*Journal of the Economic and Social History of the Orient*, 43 (2000), 496-520.
[7] Barhebraeus made, for example in the *Plants*, use of a Syriac version of the *Compendium* of Aristotle's philosophy by Nicolaus Damascenus as well as, in the *Meteorology*, in combination with Olympiodorus. However, there's no part on the *Animals* in the extant parts of Nicolaus's *Compendium* (ed.//tr. Drossaart Lulofs, a Syriac edition is being prepared by Takahashi), though it is only incompletely preserved (see the respective editions of Barhebraeus by Drossaart Lulofs and Takahashi). However, Drossaart Lulofs, "Aristotle, Bar Hebraeus, and Nicolaus Damascenus on Animals," in Gotthelf (ed.), *Aristotle on Nature and Living Things*, Pittsburgh, 1985, 345-357, 353, assumes a usage by Barhebraeus in the zoological part of the *Lantern* (instead of Aristotle, which, given the length of the citations here, doesn't seem mandatory). Barhebraeus is assumed not to have had sufficient knowledge of Greek to directly access texts. In other instances in his Biblical Commentary, for example, "in the Greek," etc., refers to Syriac versions of Greek texts, such as the *Septuagint*.
[8] Being cold-blooded in the modern sense would still allow for being blooded in the Aristotelian sense.

animals as well, they might be considered able to dream also, though still with some doubts as being oviparous animals. With regard to this overlap of groups birds might fall into, Aristotle says that bats can walk and some birds have feet as well,[9] even though not much used. Barhebraeus doesn't go into detail here, though, as he classifies animals as walking, flying, and swimming in his *Physics*, this overlap of classifications is not likely (Aristotle's "having feet" isn't less ambiguous). If, on the other hand, the ability to dream is granted to all animals having eyelids in the wider understanding of the definition, also, for example, dolphins and whales might be included. However, if Barhebraeus consider them fishes,[10] he explicitly negates their having eyelids, thus, they wouldn't be able to dream, as then neither having eyelids[11] nor being walking.

A similar treatment keeping Aristotle's original requirement of being a viviparous quadruped for dreaming, and even limiting dreaming to them besides using the Aristotelian exemplary animals, is found in Albert the Great's *Animals*, which is, similarly to Barhebraeus, primarily influenced by both Aristotle and Avicenna (he doesn't treat the topic in his *Questions on Animals*) and shall be mentioned here briefly for sake of comparison only. According to him, all walking blooded animals sleep and wake. Although he opens as Avicenna with the initial allowance of other animals to dream, he subsequently limits these to Aristotle's viviparous quadrupeds. Albert also drops the doubt about the ability to dream of oviparous animals completely. However, he is similar with Avicenna in extending the Aristotelian example of the barking dog to sounds that other animals might utter when dreaming. By this change that excludes birds, he would allow for the least number of animals to be able to dream, even less than Aristotle.

[tr.Kitchell Jr./Resnick, 2 vols., Columbus, OH, 2018, i.482-3 to be checked against the Latin] IV.3 After these things, then, it seems that we must speak about the types of sleep and waking in the aforementioned animals. Let us suppose whatever we said in the books *On Sleep and Waking*, so that we can move on more easily. We say, then, that every walking, blooded animal both wakes and sleeps. To say it briefly, every animal wakes and sleeps.

An animal that has eyelids will close them in sleep, as is clear to anyone who considers this thing for himself. That many animals and not just humans dream is clear from their cries in their sleep. These include the horse, bull, goat, dog, and many other quadrupeds that are viviparous in a womb. Dogs sometimes bark in their sleep and many other quadrupeds do much the same.

An oviparous animal sleeps little compared to a nonoviparous one. This is especially so for an aquatic animal, like fish and the ones called soft-shelled. They have but little sleep due to the small amount of evaporation created from their place of digestion. That ones such as these sleep is not known from their eyes because they have no eyelids.

The sleep of fish is known from the fact that many fish are caught when they are overwhelmed by sleep, sinking as if they were heavy and pressed down. They can sometimes be caught by hand. [...] Because fish sleep more by night, fishermen with torches spy them lying still and spear and pierce more of them with the trident by night than by day.

Most fish and sea animals sleep on the earth at the bottom, either on the sand or on a rock, since they find hiding places on the bottom in which they lie safely.

[9] *HA* 487b23 (Ar., ed. Filius, 114: all birds walk).
[10] Aristotle doesn't, but as cetaceans; Barhebraeus, however, lists dolphins and eels among fishes when discriminating by the number of gills, Florence, Or. 83, 88v; Barhebraeus's classification of animals shall be dealt with elsewhere.
[11] Which they, in fact, have.

Celeti [selachians] are so overcome by heavy sleep that they can be captured by hand. The dolphin and the kalane (that is, the cete, which is a whale [balena])—and every genus of fish that has a windpipe in its body which projects to its mouth and through which it breathes air—sleeps.

That windpipe projects out of the water when the fish breathes through it, and by moving its fin a little, the fish holds itself so as not to sink under the influence of sleep. The dolphin has been heard by many to snore in its sleep. The genuses of *malakye* also sleep, as do all the soft-shelled animals and those with hard shells. This is noticeable in the bees, for they are frequently quiet at night and make no sound. Those animals with a ringed body sleep. This is noticeable in the bees, for they are frequently quiet at night and make no sound. The reason for this is not that they do not have vision, as some have said, but rather is what has been stated. For the vision of all those having hard eyes is very weak, but they still have vision. [...]

Of all the animals, however, the human especially dreams. But it seems that children before four or five years of age do not dream because of their excessive moisture. Men and women have been found, however, who have never dreamed, right up into their dotage. Some of these individuals have begun to dream in their old age when their moisture became deficient, but after a while, infirmity set in and then they died. [...]

Discussion

It seems that Barhebraeus intentionally broadened the range of animals that are able to dream, not just by simplification, as he still renders both the Aristotelian examples as well as the discussion about sleep of fish, which he might have dropped, if simplification were his main concern. This broadening is based on Avicenna, though Barhebraeus's distinguishing criterion might be having eyelids, which are found with mammals. It's being made a criterion for dreaming is like a "mammalization" of the discussion. On the other hand, as Barhebraeus sticks to Aristotle's exemplary animals, he could be assumed to tacitly approve the criterion of being a viviparous quadruped without express mention, though this seems less likely.

Dreaming, if understood as showing certain brain activation or REM phases in sleep, is indeed attested for many mammals.[12]

Even though this isn't discussed in detail, he likely assumes a general connection between the ability to and frequency of dreaming with intellectual capacities, as man is said to dream most. Also, this excelling in the frequency of dreaming can't be explained by a more lasting permanence of more sensual impressions in a human being, as animals surpass humans in most senses' acuteness, except for touch. However, one still wonders why smaller children aren't assumed to dream at all instead of less frequently, if they weren't considered fully rationally humans yet.

Sources

So far, Barhebraeus's identifiable sources for the *Animals* are Aristotle and Avicenna besides an assumed third one of Greek origin regarding Herodotus's report. There is also evidence, though regarding a different place, that Aristotle's translation of the *History* at Barhebraeus's disposal wasn't the extant, but a different one closer to the Greek.[13] The usage of other (Late) Antique or Byzantine texts is currently unclear. Especially Nicolaus Damascenus's *Plants* have been used by Barhebraeus in his respective work,[14] and Nicolaus's *Compendium* has been

[12] See Hobson, *Dreaming*, Oxford, 2002, 51-52.
[13] See my forthcoming "Touchy Animals." Drossaart Lulofs, however, as mentioned above, assumes usage of Aristotle by means of Nicolaus's *Compendium*.
[14] See Drossaart Lulofs's edition.

employed especially in the *Meteorology*,[15] though the biological works are not covered in the extant parts. Nonetheless, Barhebraeus might have had a complete version at his disposal. He doesn't seem to have made use of Job of Edessa's Syriac *Book of Treasures*, at least according to first soundings,[16] the Syriac *Book on Natural Things*,[17] Arabic oneirocritical literature,[18] or older Arabic zoographical literature, such as Ibn Abī l-Ashʿath. to check: Abd al-Latif al-Baghdadi, al-Marwazī (also said to rely on Aristotle and Avicenna), Sezin, GAS III and Ullmann again in more detail.

Rather, peculiar for the *Animals* is the complete absence of post-Avicennan philosophical sources in contrast to most of his other works, especially those of the *Cream*, where he made even extensive use of these texts: Instead of Avicenna himself, whose texts he used to a lesser degree, he is frequently indebted to Fakhr al-Dīn al-Rāzī, Naṣīr al-Dīn al-Ṭūsī, Abū l-Barakāt al-Baghdādī, al-Abharī, Ibn Kammūna, or even al-Suhrawardī.

Also, in addition to incorporating these texts, he has been personally acquainted with many Muslim scholars, especially at Maragha, and here in particular Naṣīr al-Dīn al-Ṭūsī, which he relates in his Syriac *Chronicle*. 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,[19] an author whom Barhebraeus also uses in his *Physics*. In addition to that, he also prepared a translation of Abharī's *Zubdat al-asrār* (the title of which might have influenced that of his own *Cream*). He is also well aware of many post-Avicennan philosophers' scholarly dependencies.[20]

Thus, this astonishing absence of post-Avicennan source texts in contrast to many of his other works might be explained by a shift in the curriculum of *madāris* with a neglect of biological works (though medical works have continued to be studied, primarily at medical academies, especially the *Qānūn*).[21] Most of his post-Avicennan source texts are also in the form of Avicennan *summae*, works that are dealing with a variety of topics, though usually don't comprise biological or at least animal themes. Where later authors did treat a topic, however, such as, for example, meteorology within the *Eastern Discussions* by Fakhr al-Din al-Razi, Barhebraeus did make use of it in his own *Meteorology*.[22] That is, Barhebraeus took recourse to available texts on the topic, which were in this case only older ones.[23] This explanation is roughly, though conversely, similar to a recent suggestion by Rassi, who assumed that Bar Shakko, another representative of the Syriac Renaissance, relied generally on both Syriac and

[15] As found by Takahashi in his edition.
[16] I am indebted to Michael Payne for drawing my attention to this fact.
[17] A work in the *Physiologus* tradition containing a bestiary that has been identified as a partial source by Bakos in the *Lantern*.
[18] See Bausani, "I sogni nell'Islam."
[19] "Ibn Kammūna's and Ibn al-ʿIbrī's Responses to Fakhr al-Dīn al-Rāzī's Proofs of Muḥammad's Prophethood," in Intellectual History of the Islamicate World 2 (2014) 193-213.
[20] See also Endress's graphical rendition in his "Reading Avicenna in the Madrasa," based on Barhebraeus's reports in his Arabic *Chronicle*.
[21] See Eichner, 419, for changes already made by Bahmanyār, Endress, "Reading Avicenna," and Makdisi, *The Rise of Colleges*, 250.
[22] See the Index Loc. in Takahashi's edition.
[23] So far, there's no evidence of a usage of al-Jāḥiẓ's monumental work, Timothy of Gaza (see Kruk on his Arabic influence, such as, for example, found later in al-Damīrī, but there's also a similarity with al-Waṭwāṭ, who, though also dependent on Ibn Abī l-Ashʿath, mentions that horses dream like humans, which, though Aristotelian, is similarly found among the remnants of Timothy of Gaza's text, tr. Bodenheimer/Rabinowitz), Ibn Abi l-Ashʿath himself, or, for example, al-Tawḥīdī (the latter, for example, has the buffalo as not sleeping at all, see Haupt).

Arabic logical texts, though employed recent Arabic ones only in those cases where no Syriac text was available.[24] Barhebraeus's selection would point to the opposite case here, namely, taking recourse to Syriac or older Arabic texts where no contemporary Arabic versions are available. Also, he perhaps focused intentionally on certain philosophical authors of the Islamic East who weren't too interested in biological themes (namely, those mentioned above, some of whom he knew personally), or those existent Western texts on animals by, for example, Ibn Rushd or Ibn Bājja were not easily available to him.[25]

However, one of his often cited authors, Nasīr al-Dīn al-Ṭūsī, indeed deals with the (Aristotelian) scale of nature, though not in a biological work, but within his Nasirean Ethics, a work that Barhebraeus made use of in his own *Ethics* of the *Cream*, and Barhebraeus renders also this particular passage into Syriac, even though he doesn't seem to have included it into his *Animals* as well.

Conclusion

To sum up briefly, Barhebraeus might, as also, though less explicitly, Avicenna, allow for more animals to be able to dream than Aristotle, namely, perhaps all animals having eyelids, which then might imply also oviparous quadrupeds in addition to viviparous quadrupeds only as in Aristotle, and perhaps also birds.

Despite an abbreviating systematization in presenting the material that he combined out of at least two sources identified so far, namely, Aristotle's *History of Animals* (either an older Arabic or a Syriac one) and Avicenna's *Animals* of the *Healing*, Barhebraeus seems to have made these alterations intentionally.

His taking recourse to older authors by skipping contemporary post-Avicennan philosophers is due to non-coverage of biological themes by authors he otherwise focused on, namely, philosophers of the East. This, in turn, might be by Barhebraeus still focusing on the Aristotelian or Avicennan curriculum of science, while his contemporaries shifted their focus to, for example, 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 have primarily relied on these instead of taking recourse to older ones.

A test case for this hypothesis could be instances where topics are dealt with by Barhebraeus, Avicenna, and post-Avicennan philosophical authors. Then, Barhebraeus would be expected to include the modern discussions as well. For example, Barhebraeus's also inedited *Book on the Soul* might perhaps help to clarify this issue, for there are, for example, some remarks in Fakhr al-Dīn's *Eastern Discussions* on faculties of the soul within the part on metaphysics. It would be helpful to investigate in detail whether Barhebraeus made use of them in his own *Book on the Soul* within the *Cream* (roughly, so far, it looks being quite modeled on Avicenna's book only).

[24] "From Greco-Syrian to Syro-Arabic Thought," in Fiori/Hugonnard-Roche (eds.), *La philosophie en syriaque*, Paris, 2019, 328-379; 359.

[25] Ibn Rushd's text were also received in the East as well, though to a far lesser degree. There are some cases in the *Physics* that could indicate an awareness of Ibn Rushd's commentary.