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Walter Burley on the Role of the Heart and the Brain in Human Cognition*

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Abstract

Walter Burley’s commentary on Aristotle’s *De somno et vigilia* discusses a number of issues that go beyond explanations of sleep and dreaming. One of these is the role of the brain and the heart in human sense perception. While Burley eventually supports Aristotle’s view that the heart is the organ of the common sense and thus “the principle” of sensory cognition, he finds a cognitive role for the brain, too, even though he also identifies its other “occupations.” The complex scheme of relations between various organs of both the exterior and the interior senses bespeaks medieval scholars’ attention to the physiological aspect of cognition.

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1. Introduction

The image of the heart as the symbol of love is probably one of the last vestiges of its association, before William Harvey (1578–1657), with things much nobler than the pumping of the blood: emotions and cognition. This notion of the heart was widely recognized in pre-modern times, as implied by ample evidence found across a wide range of literary genres. The brain, by contrast, was somewhat neglected, as if the early authors were not sure what role it could play. Needless to say, the heart and the brain were both discussed in philosophical writings, too. In the Middle Ages, a more “scientific” approach to the heart as a sensory organ developed in the thirteenth century after Latin translations of Aristotle, Avicenna, and other thinkers had reached universities in Western Europe. By the turn of the fourteenth century, scholars at Paris, Oxford, and other centers of learning could consult relatively rich libraries of both old and new writings on psychology and physiology.

Walter Burley (ca. 1275–ca. 1345) was one of these scholars. Having begun his regency in the Faculty of Arts at Oxford in 1301, he spent the following six to seven years teaching there and commenting on many of Aristotle’s texts that were part of the curriculum, including a set of short treatises on psychology and physiology, known as the *Parva naturalia*. Burley’s commentary on Aristotle’s *De somno et vigilia*, which belongs to this set, discusses a number of issues that go beyond explanations of sleep and dreaming. To guide his commentary on Aristotle’s text, Burley, as is his wont, relies on a prior commentator and uses a question commentary on *De somno et vigilia* by the Oxonian Simon of Faversham (1260–1306) as his source material. In the second part of his own commentary, Burley analyzes actions of the various (external and internal) senses in sleep and waking. Besides providing the literal commentary that explains the issues dealt with by Aristotle, he raises four questions (the numbers indicate their positions in the commentary): (5) whether sleep occurs earlier than waking in animals; (6) whether sleep is a passion of the common sense or of another particular sense; (7) whether sleep is a passion of the heart; (8) whether the heart (rather than the brain) first conceives of sense perceptions.¹ While question 8 contains

¹ Gensler & Mansfeld, 2025, p. 66.

material from Simon of Faversham's question 5, no direct borrowings of this kind have been identified in the remaining questions. Apart from question 5, all of Burley's questions address the functions of the brain and the heart not only in sleep but also in wakefulness.

2. Anatomical and Physiological Background

To start with, Burley notably believes that the functions of the brain and the heart are not limited to cognitive processes; both organs, he insists, have several roles to play, and their actions pertain to the sensitive and the vegetative soul. As a result, the processes involved in the psychological and physiological roles are intertwined, with the former being dependent on the latter. In view of this relationship, I will first look into Burley's comments on human anatomy and the physiology of the heart and the brain, before moving to his discussion of their cognitive functions.

The heart and the brain do not receive equal treatment in Burley's commentary. References to the cognitive role of the heart are much more frequent and straightforward, whereas references to the brain usually occur in the polemical context. It is easy to understand this asymmetry. Specifically, whereas Burley endorses Aristotle's view of the heart as the first principle of the senses (*primum principium sensitivum*),² he also discusses a competing theory that locates the *primum principium sensitivum* in the brain.³ Correctly ascribing this notion to Avicenna, Burley is unwilling to discard Avicenna's idea outright, but tries to reconcile the two theories by having both organs receive proper attention.

The anatomical arguments in the dispute on the cognitive role of the heart and the brain concern their positions in the body and their relations to the nervous system. Burley's reasoning regarding the nervous system is not developed at length; he simply states that the principle of the senses is situated in the organ that is the first principle of the nerves and that, according to one opinion, the principle of the nerves is identified with the brain,⁴

² Aristoteles, *De somno et vigilia*, 2, 455b, 34–456a, 2.

³ Avicenna, *Liber de anima*, pars V, cap. 8 (ed. van Riet, 1968, pp. 181:46–182:70).

⁴ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 182): “(3) Praeterea, ibi est primum principium sensitivum, ubi est primum

although he himself thinks that it is in the heart.⁵ Regrettably, Burley gives no reasons for either of the alternative standpoints, as if he was wary of engaging in purely medical issues, which required a better knowledge of anatomy than his.

The argument concerning the position of the first principle of the senses in the brain is more developed. In this respect, Burley cites the opinion of Avicenna, who claimed that the principle of the senses was located in the anterior part of the brain.⁶ This view is supported with one argument, stating that the principle of the senses should be located in the part of the body that maintains the temperature of the vital spirit (*spiritus*), a fiery-airy vivifying substance produced from the lightest elements in the heart, that is best for the performance of the senses. This optimum condition is obtained in the brain, because its coldness tempers the heat of the spiritus, whereas it is at its hottest in the heart. Burley relates Avicenna's argument:

The first principle of the senses is in the part in which the spirits are better proportioned for completing the act of sensing, but the spirits are better proportioned in the brain, because the more temperate the heat of the spirits, the better their proportion; now their heat is more temperate in the brain, because the coldness of the brain tempers the heat, and their heat is at its most intense in the heart.⁷

principium nervorum, quia nervi sunt organa sensuum, sed primum principium nervorum est in cerebro; igitur et cetera.”

⁵ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 185): “(Ad 3) Ad aliud dicendum quod primum principium nervorum est a corde et non a cerebro; ideo et cetera.”

⁶ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 182): “(2) Praeterea, Avicenna dicit quod primum sensitivum est in anteriori parte capitis medullosa, igitur non est in corde.”

⁷ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 182): “(1) [...] primum sensitivum est in ista parte, ubi spiritus sunt magis proportionales ad operationem sensuum complendam, sed spiritus sunt magis proportionales in cerebro, quia, quanto spiritus habent caliditatem magis temperatam, magis sunt proportionales; sed magis temperatam caliditatem habent in cerebro, quia per frigiditatem cerebri temperatur caliditas et in corde est calidum excellens.”

3. The Role of the Heart

In contrast to this brevity, the opposite opinion, which Burley attributes to Averroes and himself embraces, is discussed more extensively.⁸ This view holds that the common sense is located in the heart,⁹ for a number of reasons. First, it is stated that every particular sense is situated in a particular part of the body. Since the senses are not equal in power in animals, Burley proposes that, reasonably speaking, the power that is absolutely the first in an animal should be bound to the part of the body that is absolutely the first as well.¹⁰ The question is which power is absolutely first and which part of the body is first.

For Burley, the power of sensation is the first power of an animal, which is a sentient being. By the same token, the first organ that develops in the generation of the body must be the principle of the senses. However, the issue is more complex than it seems, for the principle of the senses can mean two things: either something that is the terminus for alterations originating in all the senses or something that is the immediate terminus for alterations originating in three senses: sight, hearing, and smell.¹¹ The latter understanding, which is more particular, is discussed in the next section; here, I focus on the former—and more general—one.

If the former understanding of the principle of the senses is adopted, it must be situated in the heart, because Burley regards the heart as the first organ formed in the generation of an animal. He supports his claim with Simon of Faversham's observation that, on being hit, the heart shrinks,

⁸ Averroes Cordubensis, *In De somno et vigilia* (ed. Shields, pp. 84:54–85:3).

⁹ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 182): “Oppositum dicit Commentator hic. Dicit enim quod sensus communis est in corde.”

¹⁰ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 182): “Et hoc probatur per rationem sic: determinatus sensus est in determinata parte corporis, igitur videtur quod in parte corporis simpliciter prima oportet esse virtus simpliciter prima.”

¹¹ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 182): “Dicendum quod per primum sensitivum possumus duo intelligere. Uno modo dicitur illud esse sensitivum primum ad quod terminantur immutationes omnium sensuum. Alio modo dicitur illud sensitivum primum ad quod immediate terminantur immutationes trium sensuum, scilicet visus, auditus et olfactus.”

which indicates a tactile reaction and thus proves that the heart is the site of the sense of touch¹² (itself the first of the senses, according to Aristotle¹³). This makes Burley conclude that the heart must also be the locus of the common sense since, besides touching, it also perceives itself touching, and this reflexive perception is characteristic of the common sense. Burley argues:

According to the first formulation, the first principle of the senses is in the heart, but according to the second formulation, it is in the brain. The reason for the former is that the heart is the first of the animal's bodily parts to be generated, and upon being generated it has the sense of touch, because it [reacts by] withdrawing itself when hit. That would not happen if there were no touch in it. And if there is touch, there is also the common sense, because a being that possesses the power of touch not only touches but perceives itself touching, which can only happen by the common sense. Therefore, the common sense is in the heart before other parts [of the body] are generated, regarding the common sense understood as the terminus of all changes in all [the other] senses.¹⁴

This idea is corroborated by the observation that the heart is the last organ to die, because when the other parts of the body are already cold, it is still alive and has the sensing power. As, according to Burley, there can be no sense without the common sense, the common sense must be located in the heart.¹⁵

¹² See Simon de Faversham, *Quaestiones in De somno et vigilia*, q. 5 (ed. Ebbesen, 2013, pp. 114–115): “Animal est animal propter sensitivum primum; nunc autem primum sensitivum in animali est ipsum cor, cuius ratio est quia formato corde non formatis aliis partibus ipsum retrahit se si pungatur, et hoc non esset nisi sensitivum esset in ipso.”

¹³ Aristoteles, *De anima*, II,3, 414b, 3–6.

¹⁴ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, pp. 182–183): “Primum sensitivum primo modo dictum est in corde, sed primum sensitivum secundo modo dictum est in cerebro. Ratio primi est, quia cor est prima pars quae generatur inter partes animalis, et corde generato est ibi tactus, quia, si pungatur, retrahit se. Quod non esset, nisi esset ibi tactus, et, si tactus, igitur sensus communis, quoniam habens tactum non solum tangit, sed percipit se tangere, quod non esset nisi per sensum communem; igitur sensus communis est in corde antequam aliae partes generentur, loquendo de sensu communi ad quem terminantur omnes immutationes omnium sensuum.”

¹⁵ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 183): “Similiter, cor est pars quae ultimo morietur, quia aliis partibus infrigidatis

Another pair of arguments in support of the idea that the heart is the location of the common sense is informed by the claim that there is a link between sensation and motion. In one of them, Burley adduces Aristotle's view that the principle of the senses and motion is the same¹⁶ and argues that the principle of motion is in the heart. This is because the principle of motion must be located where it can activate both the right side and the left side of the body. The central position of the heart in the body warrants this, which alone is sufficient to prove that the heart is the location of the principle of motion and, consequently, of the senses.¹⁷ In the other argument, Burley states that the power (*vigor*) that moves everything is caused by the perseverance (*perseverantia*) of the vital spirits. He reasons that if the principle of the spiritus is in the heart, the principle of motion is also in the heart; and if the principle of motion is in the heart, the principle of the senses is in the heart, too.¹⁸

4. The Role of the Brain

Having provided arguments in support of his main claim—that the heart is the location of the principle of the senses understood as the terminus for alterations originating in all the senses—Burley can now make concessions to the Avicennian solution and argue that the brain is the principle of the senses

et quasi mortificatis adhuc vivit cor et in eo est sensus; sed nullus sensus est sine sensu communi.”

¹⁶ Aristoteles, *De somno et vigilia*, 2, 455b, 34–456a, 2.

¹⁷ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 183): “Item, idem est principium motus et sensus per Philosophum. Sed primum principium movens in animali est in corde, nam movens et motum sunt distincta et movens prius est moto naturaliter. Sed in animali inveniuntur duae partes moveri, scilicet pars dextra et pars sinistra, igitur moventur ab aliquo priori eis secundum naturam. Et hoc non potest esse, nisi sit aliquod situatum in medio ipsorum quod sit prius ipsis secundum naturam; et hoc est ipsum cor.”

¹⁸ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, pp. 183–184): “Item, omne quod movet, per vigorem movet. Vigor autem causatur ex perseverantia spiritus. [...] Sed principium cuiuslibet spiritus motivi originaliter est a corde, igitur primum principium motivum est in corde. Sed, ubi est primum principium motivum, ibi est primum principium sensitivum; igitur primum principium sensitivum est in corde.”

understood as the immediate terminus for alterations originating in three senses: sight, hearing, and smell.¹⁹ The reason for this compromise is that the senses function in different ways and require different conditions for their performance. Some senses need the most intense heat, because they are acted upon in a more material manner by more material qualities, while others need moderate heat. The former, specifically touch and taste, must have their principles located in the heart, which is the hottest organ in the body and the principle of heat.²⁰ The remaining three senses, whose organs are acted upon in a more spiritual manner, require moderate heat for their performance. This is why their principles are located in the brain, which is cold by nature and thus mitigates the heat coming from the heart. Nonetheless, as there is no complete judgement of alterations in these senses until they come to the heart, the absolute principle of the senses must be in the heart. It is interesting to see how Burley organizes his argument to reconcile the two opposite opinions:

But the other senses, which are altered by objects through temperate heat and are changed more spiritually, are situated next to the brain, where the heat coming from the heart is moderated by the coldness of the brain. Therefore, the brain is the first principle of these senses, even though the process of change comes to an end in the heart because, granting that alterations of [some] senses reach the brain, still there is no complete judgement of the alterations there until they reach the first principle of the senses, which is the heart. Therefore, the first principle of the senses in the absolute sense is in the heart.²¹

¹⁹ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 184): “Loquendo tamen de primo sensitivo ad quod terminantur immutationes trium sensuum, dico quod illud est in cerebro.”

²⁰ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 184): “Et ratio est, quia quidam sensus indigent excellenti caliditate ad hoc quod sentiant, quia immutantur materialiter et a qualitatibus magis materialibus. A corde autem est primum principium caliditatis. Et ideo organa talium sensuum situata sunt iuxta cor, cuiusmodi sunt tactus et gustus.”

²¹ Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 184): “Sed alii sensus qui immutantur ab obiectis per caliditatem temperatam et spiritualius immutantur organa ipsorum sunt situata iuxta cerebrum, ubi per frigiditatem cerebri caliditas quae est a corde est temperata. Ideo cerebrum est primum principium istorum sensuum, verumtamen immutationes illorum sensuum ultimo terminantur ad cor, quia, etsi alterationes sensuum perveniunt ad cerebrum, adhuc non est ibi complete

Of course, when talking of “spiritual” changes, Burley uses the term in its materialist meaning of a vital spirit that consists of fiery and airy matter, simply stressing their subtler nature. In the same vein, when he talks of the “more material” qualities of touch and taste, he underlines their less subtle nature. According to Burley, this is what Avicenna actually had in mind when stating that the first principle of the senses was located in the anterior part of the brain.²²

5. Cooperation Between the Heart and the Brain

Once the division of labor between the heart and the brain has been established, Burley can discuss other issues. In line with the main focus of the text he comments on, he analyzes the functioning of the senses during sleep. In this respect, he also insists on the involvement of both the brain and the heart. Since sleep means, among other things, the suspension of cognition, in which both organs are instrumental, it is important to know what is switched off, where, and for what reason. As before, Burley draws on physiology to explain the psychological process and ponders whether sleep belongs to the heart or to the brain, seeing that sleep is the attribute of the part of the body whose power is bound in sleep.²³

His answer is complex, like his solution to the problem of the first principle of the senses. He reports that there are two opinions on this issue, with one attributing sleep to the brain and the other ascribing it to the heart. Although Burley himself favors the latter, he gives due attention to the former, too.²⁴ Interestingly, his main reason for supporting the “heart option” seems to be related to its locomotive, rather than cognitive, function.

iudicium de alteratione antequam perveniant ad primum sensitivum, ut ad cor. Et ideo primum sensitivum est in corde simpliciter.”

²² Walter Burley, *Commentarius in De somno et vigilia*, q. 8 (ed. Gensler & Mansfeld, 2025, p. 184): “Et hoc vult Avicenna qui dicit quod primum sensitivum non simpliciter sed secundum quid, id est respectu trium sensuum, est in anteriori parte capitis.”

²³ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 179): “Quaeritur: cuius partis corporis somnus sit passio, utrum scilicet cordis? Et videtur quod non, nam somnus est passio illius partis cuius virtus ligatur in somno.”

²⁴ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 180): “Ad quaestionem dicunt quidam quod somnus est passio cerebri et quidam quod est passio cordis.”

Because the principle of motion and rest must be the same, and the heart is, as we have seen, the principle of motion, the heart must also be the principle of sleep, given that sleep is a kind of rest.²⁵ Burley responds to a possible objection—that somnambulists can walk while asleep—elsewhere, saying that the organ of motion is situated next to the heart and thus is not strongly affected by the descent of the cooled vapor.²⁶ However, he does not explain why the similar position of the principles of touch and taste does not produce similar results and treats all the exterior senses in the same way.²⁷ At the same time, in describing wakefulness, he states that it consists of an act of perception or, at least, a disposition for it, whose absolute principle is in the heart, thus fully acknowledging the heart's cognitive function.²⁸

Burley notes that even those who claim that sleep is a passion of the brain admit that the principle of sleep is in the heart, because the latter is also the principle of all acts of perception with respect to its origin and its first act. Nevertheless, they insist that the brain is the principle of the senses with respect to operations and the second act, that is, the one that follows the act of the heart, in which perception originates. Since sleep is the immobilization of the senses with respect to operations and the second act, it must be a passion of the brain.²⁹ This notion is also substantiated by the observation

²⁵ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 180): “Praeterea, idem est principium motus et quietis, sed cor est principium motus animalis; igitur cor est principium quietis, sed somnus est quies animalis, ergo cor est principium somni; igitur somnus est passio cordis.”

²⁶ Walter Burley, *Commentarius in De somno et vigilia*, q. 10 (ed. Gensler & Mansfeld, 2025, p. 193): “Immobilitatio in sensus exterioribus contingit ex hoc quod calor procedens a corde non influit virtutem in organa sensuum exteriorum propter descensum vaporis in frigidati. Sed non oportet quod organum motus immobilitetur, quia organum motus situatum est iuxta cor.”

²⁷ Walter Burley, *Commentarius in De somno et vigilia*, (6) *Consequenter autem cum his*, (ed. Gensler & Mansfeld, 2025, p. 198): “Intelligendum est quod evaporationes ad cerebrum elevatae et ibidem in frigidatae propter gravitatem suam necesse est descendere non solum per easdem vias sed per alias, ut per concavitates nervorum deferentium spiritus vitales et calorem ad organa sensuum exteriorum; et tunc impediendo influxum sensus communis ad sensus exteriores causatur somnus.”

²⁸ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 181): “Vigilia consistat in actu sentiendi vel in dispositione ad actum sentiendi.”

²⁹ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 180): “Sed dicunt quod cor est principium somni et omnium actionum sentiendi quantum ad originem et quantum ad actum primum. Sed cerebrum est principium

that because the brain is where the vapors, the descent of which causes sleep, are cooled, sleep must be a passion of the brain.³⁰

When discussing the opinion that sleep is a passion of the heart, Burley first notes that some conclude the following: sleep is principally the passion of the heart, so sleep must also take place in the heart, just like the common sense, whose passion sleep is.³¹ Although this argument seems coherent and compelling, Burley rejects it. His own opinion calls for a meticulous explanation of the complexity of sleep, which, in his view, cannot be confined to any particular organ of the body, but occurs in every part of it. (Given this, Burley defines sleep by reference to the motor functions.) This is clear when considering the cognitive functions. Sleep does not just inactivate one sense, but affects all of them. For this reason, sleep should not be linked either only to the brain or only to the heart. Similarly, since wakefulness essentially entails an act of perception of whatever sense, it is present in all the organs of the senses. As both sleep and wakefulness impact the whole of the body, they can be regarded as being subjectively in the entire body. Yet, sleep and wakefulness are principally in the heart, because it is the primary part of every animal and the source of all powers of the other organs, including the organs of the senses. The length and complexity of Burley's reasoning on this issue warrant quoting in full:

But neither of these opinions is valid, because from [the fact that] sleep is the immobilization of the senses, and not just one sense but any sense, it follows that sleep immobilizes the senses everywhere, so, since all the senses are immobilized in sleep, sleep must occur in each organ of the senses. Therefore, it is not to be assumed that sleep is only in the brain or only in the heart.

sensitivum quantum ad operationem et quantum ad actum secundum. Et, quia somnus est immobilitatio sensuum quantum ad operationem et quantum ad actum secundum, ideo dicunt quod somnus est passio cerebri.”

³⁰ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 180): “Dicentes tamen quod est passio cerebri dicunt hoc, quia somnus causatur ex elevatione vaporum ad cerebrum. Cum enim vapores eleventur ad cerebrum et ibi infrigidantur, fiunt vapores graves et descendunt propter gravitatem et obturant meatus spirituum et impediunt, ne sensus communis possit influere virtutem ad sensus exteriores.”

³¹ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 180): “Et alii dicunt quod somnus est passio cordis principaliter, ita quod inter partes corporales principaliter habet fieri in corde. Et hoc est, quia cor est principium motus omnium sensuum, ideo est principium quietis, et sic est principium somni. Et similiter sensus communis (cuius somnus est passio) est in corde; ideo somnus est subiective in corde.”

Similarly, wakefulness consists in an act of sense perception, so, since an act of sense perception is in the organ of each and every sense, wakefulness must occur in the organ of whichever sense. Therefore, since sleep and wakefulness occur with respect to the same [subject], it follows that sleep is in the organ of each and every sense, so it is neither only in the brain nor only in the heart. For this reason, it should be said that sleep is subjectively in the sleeper and is not determined to any part of the body in such a way that it is in no other one. This is because sleep and wakefulness occur with respect to the same subject. But wakefulness is in the whole body, because it consists of the act of sense perception, and the act of sense perception occurs in each and every part of the body, or at least each part of an animal, while awake, is disposed to an act of sense perception. Therefore, since wakefulness consists of the act of sense perception or of a disposition for it, it is evident that wakefulness is in the entire body and, consequently, that sleep is in the entire body. Yet, the heart is the principal part of the body, and the power of every other part is drawn from the heart; for this reason, the heart is the first principle of the senses. For the same reason, wakefulness is principally in the heart, as is sleep.³²

At the same time, the brain is the efficient cause of sleep, because it is where the vapors, whose descent causes sleep, are cooled.³³

³² Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, pp. 180–181): “Sed neutra istarum opinionum valet, nam ex quo somnus est ligatio sensuum et non solum unius sensus, sed cuiuslibet sensus, oportet quod somnus sit ubicumque ligatur sensus, et tunc, cum ligentur omnes sensus in somno, oportet quod somnus sit in organo cuiuslibet sensus; igitur non est ponere quod somnus sit solum in cerebro nec etiam solum in corde. Similiter, vigilia consistit in actu sentiendi, cum igitur actus sentiendi sit in organo cuiuslibet sensus, oportet quod in organo cuiuslibet sensus sit vigilia. Cum igitur somnus et vigilia habent fieri circa idem, sequitur quod somnus habet esse in organo cuiuslibet sensus; igitur non solum habet esse in cerebro nec solum in corde. Ideo dicendum est quod somnus est subiective in dormiente et non est determinate in una parte corporis, ita quod non in alia; cuius ratio est: quia somnus et vigilia habent fieri circa idem subiectum. Sed vigilia habet esse in toto corpore, quoniam vigilia consistit in actu sentiendi et in qualibet parte corporis est actus sentiendi, vel saltem quaelibet pars animalis in vigilando est disposita ad sentiendum in actu. Cum igitur vigilia consistat in actu sentiendi vel in dispositione ad actum sentiendi, patet quod vigilia habet esse in toto corpore, et per consequens somnus habet esse in toto corpore. Verumtamen cor est principalis pars animalis et a corde influitur virtus cuilibet alteri parti; ideo cor est primum principium sentiendi. Et ideo vigilia habet principaliter esse in corde, et ideo somnus habet principaliter esse in corde.”

³³ Walter Burley, *Commentarius in De somno et vigilia*, q. 7 (ed. Gensler & Mansfeld, 2025, p. 181): “Aliae rationes probant quod cerebrum est causa effectiva somni.”

Burley's examination of sleep also yields interesting insights into the relations between the common sense, which is located in the heart, and the external senses. Burley cites Aristotle's opinion in Book III of *De anima*, where the relation between the common sense and the particular senses is compared to that between the center of a circle and the lines that run from the center to the circumference:³⁴ the common sense is the foundation upon which the exterior senses are established. For this reason, when the common sense is immobilized, the exterior senses are immobilized as well.³⁵ To explain this relation more accurately, Burley avails himself of another comparison, likening the common sense to a cloud situated between an individual and the sun. As the cloud prevents the sunlight from reaching the individual, so the common sense, when deactivated, prevents the heat and the spiritus from reaching the external senses and turns them back to the internal ones.³⁶ This action makes memory, phantasy, and judgement free to act.³⁷ This example underlines the preeminence of the common sense over the other senses with respect to the immediate flow of the powers to act.³⁸

³⁴ Aristoteles, *De anima*, III, 10, 433b, 30–31.

³⁵ Walter Burley, *Commentarius in De somno et vigilia*, q. 6 (ed. Gensler & Mansfeld, 2025, p. 177): “Ad quaestionem dicendum quod somnus est passio sensus communis; cuius ratio est: nam in somno ligantur omnes sensus exteriores, igitur necesse est aliquid primo ligari super quo fundantur sensus exteriores. Huiusmodi est sensus communis, nam per Philosophum secundo (sic!) *De anima* sensus communis est velut centrum, quoniam se habet ad sensus particulares sicut centrum in circulo se habet ad lineas exeuntes a centro ad circumferentiam. Et ideo sensus communis est illud quod primo ligatur in somno.”

³⁶ Walter Burley, *Commentarius in De somno et vigilia*, q. 6 (ed. Gensler & Mansfeld, 2025, p. 178): “Somnus non est passio sensus particularis, sed cessante sensu communi a sua operatione cessant omnes alii sensus a suis operationibus; ergo somnus est passio sensus communis. Unde intelligendum quod sensus communis est inter sensus exteriores et interiores sicut nubes inter nos et Solem. Unde, sicut nubes prohibet lumen Solis venire ad nos et facit ipsum reflecti versus Solem, sic sensus communis ligatus prohibet influentiam caloris et spiritus pervenire ad sensus exteriores et facit ipsa reflecti ad sensus interiores.”

³⁷ Walter Burley, *Commentarius in De somno et vigilia*, q. 6 (ed. Gensler & Mansfeld, 2025, p. 179): “Dicendum quod in somno non solum debilitatur virtus exterior, sed primo et principaliter debilitatur virtus interior, scilicet sensus communis. Unde, licet quidam sensus interiores, ut phantastica et memorativa, solvantur in somno (quae virtutes sunt retentivae specierum sensibilibium), et etiam aestimativa (quae percipit species non sensatas), tamen sensus communis (qui est receptivus specierum sensibilibium) ligatur in somno.”

³⁸ Walter Burley, *Commentarius in De somno et vigilia*, q. 6 (ed. Gensler & Mansfeld, 2025, p. 178): “Dicendum est quod unus sensus dicitur esse alio prior tripliciter:

This reasoning leads Burley to conclude that the role of the common sense corresponds to that of the most eminent power or the power that rules over the other senses. When it ceases to perform its operations, they stop theirs, too.³⁹

6. Conclusion

My brief overview of Burley's remarks on the role of the brain and the heart in animal cognition in three questions of his commentary on *De somno et vigilia* suggests some conclusions. Admittedly, as this theme is not central to Burley's argument in the questions, the relevant material is somewhat scant, yet it is not insufficient for reconstructing his views on the issue. As is typical of Burley, his position is conciliatory. It is underpinned by the distinction between the absolute and relative understanding of the principle of the senses, which was drawn by Simon of Faversham in question 5 of his commentary on *De somno et vigilia*.⁴⁰ Burley is aware that Aristotle believed the brain to have a largely vegetative role and to function as the body's cooler for the spiritus transporting heat from the heart.⁴¹ Aristotle also argued that the three external senses—sight, hearing, and smell—were positioned next to the brain because this location created suitable conditions for their operations. Burley accepts this explanation but adds, following Avicenna,

aut quantum ad vitae necessitatem aut quantum ad immediatam virtutis influentiam aut quantum ad cognitionem. Quantum [...] ad immediatam virtutis influentiam est sensus communis prior aliis."

³⁹ Walter Burley, *Commentarius in De somno et vigilia*, q. 6 (ed. Gensler & Mansfeld, 2025, p. 178): "Unde sensus communis inter alios sensus est sicut princeps, cui omnes alii sensus innituntur. Ideo sensu communi vacante et cessante a sua operatione cessant omnes alii sensus a suis operationibus."

⁴⁰ Simon de Faversham, *Quaestiones in De somno et vigilia*, q. 5 (ed. Ebbesen, 2013, p. 115): "Unde sensitivum primum dupliciter potest dici: vel sensitivum primum simpliciter, et sic est in corde, vel respectu istorum trium sensuum, et sic est in cerebro. Et quod sensitivum primum simpliciter sit in corde signum est quia licet alterationes sensuum perveniant ad cerebrum, ibi non est completum et perfectum iudicium, sed oportet quod a cerebro perveniant ad cor et ibi perventis statim de ipsis est iudicium completum et terminatum; et ideo sensitivum primum simpliciter est in corde, sensitivum primum secundum quid est in cerebro."

⁴¹ Aristoteles, *De somno et vigilia*, 3, 414b, 23–30.

that the brain is actually the principle of these senses, albeit in a secondary way.⁴² What is really important for sensory cognition, however, is the heart. Strange though it may be, Burley does not articulate any objections to Aristotle's view, which attributed so many different functions to a relatively small and simple organ. The main reason for Burley's endorsement of this view is that, apparently, his approach to anatomy and physiology is speculative, rather than experiential. This can be seen, for instance, in the importance Burley ascribes to the argument in which the centrality of the heart in the body determines its role as the principle of heat, the principle of the spiritus, the principle of motion, and the principle of the senses. All things considered, this part of Aristotelian teaching was something that Walter Burley evidently learned by heart.

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⁴² Avicenna, *Liber de anima*, pars V, cap. 8 (ed. van Riet, 1968, pp. 181:46–182:70).

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