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WALTER BURLEY ON THE *SPIRITUS* IN THE *PARVA NATURALIA* COMMENTARIES*

The history of *spiritus*, one of the fundamental concepts in Aristotelian psychological and physiological teaching, is a representative case of blending various traditions. Originally known as *pneuma*, it was considered to be the animating substance responsible for all kinds of activity in plants and animals. Aristotle presented a rough outline of its functions,¹ which was later filled in by his successors with detailed descriptions of its application in various organs of a body. This became visible when Aristotle's works on natural philosophy were translated into Latin together with some of the Greek and Arabic commentaries. The concept of *pneuma*, rendered as *spiritus*, was endowed with the meanings provided by Greek and Arabic philosophers to such a degree that it was no longer possible for the Latin scholars to tell Aristotle's original sense and later additions apart from one another.

Walter Burley, who is a third generation commentator of Aristotle's natural works in the Latin West,² uses the concept of *spiritus* as the central concept of

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¹ For the importance of the concept of *pneuma* in Aristotle's philosophy, see: A.P. Bos, "Pneuma as Quintessence of Aristotle's Philosophy," *Hermes*, vol. 141/4 (2013), p. 417–434.

² The first generation of Latin commentators are the master who mostly used Avicenna's *De anima*, such as Dominic Gundissalvi or John Blund (early thirteenth century); the second one, in which the *Parva naturalia* set appeared in Latin translation, came in 1230s and its most eminent representatives are Albert the Great and Adam of Buckfield; the third generation, which was started by Geoffrey of Aspill appeared in 1260s. Cf. D.A. CALLUS, "Introduction of Aristotelian Learning to Oxford," *Proceedings of the British Academy*, vol. 29 (1943), p. 3–55. Cf. also:

his theory of life. He was fortunate to have access to the Merton college library in Oxford, well furnished with Latin translations of both Aristotle and his commentators as well as works of contemporary scholars. Having such a variety of sources at hand, he tried to blend the original Aristotelian doctrine with ideas taken from a number of other sources: Greek, such as Galen, Arabic, such as Avicenna, and Latin, such as Simon of Faversham.³ His commentaries resulted from his teaching activities at the Faculty of Arts, most probably between 1301 and 1306. Burley left behind five commentaries on the *Parva naturalia*, i.e. *De sensu et sensato*, *De somno et vigilia*, *De longitudine et brevitae vitae*, *De memoria*, and *De motu animalium*, greatly varying in form, length, and execution.⁴ None of the commentaries contains information that would allow the reader to establish its relation with any other, still less to arrange them in a sequence. What is most important for our purpose, however, is that in each of them Burley discusses various applications of the *spiritus*. In this study, we present a fresh look at his hitherto unpublished commentaries and reconstruct his doctrine of *spiritus* on the basis of materials coming from four out of five of them.⁵

Burley, who justly earned the title *doctor planus et perspicuus*, is a good representative of the scholastic tradition of his times, especially that he tries to incorporate material from various available sources. Reconstructing his views is, therefore, giving a reader a good insight into the scientific paradigm of his times. The concept of *spiritus* occupies a special position in the Aristotelian philosophy of nature, since it is the very pivot between psychology and physiology and has application to all living creatures: plants, animals, and human beings.

For Burley the functioning of *spiritus* is parallel to the actions of the vegetative and sensitive souls. Accordingly, he envisages its role in numerous functions of bodily organs, from the ones which are basic for all living beings, such as digestion, to complex ones, found only in animals, in which bodily action is coordinated with higher functions of the soul, such as cognition.⁶ His presentation is

M. GENSLER, M. MANSFELD, M. MICHAŁOWSKA, “The Development of Aristotelian Psychology and Physiology in Medieval Europe between 1200 and 1420,” *The Embodied Soul: Aristotelian Psychology and Physiology in Medieval Europe between 1200 and 1420*, edited by M. Gensler, M. Mansfeld, M. Michałowska, Cham: Springer, 2022, p. 2–13.

³ For more information on Burley’s sources used in his *Parva naturalia* commentaries see: M. GENSLER, M. MANSFELD, “A Young Master and His Library: Walter Burley’s Sources for Commenting the *Parva naturalia*,” *Die Bibliothek – The Library – La Bibliothèque: Denkräume and Wissensordnungen*, edited by A. Speer, L. Reuke, Berlin – Boston: De Gruyter, 2020, p. 238–249.

⁴ Burley’s commentaries on the *Parva naturalia* in our edition are forthcoming in Brill (2023).

⁵ All quotations come from our critical edition. Manuscript references have been limited to the text basis, i.e. ms. Vat.Lat. 2151 (V). Text division into chapters and paragraphs, as well as numbers of questions, are introduced by the editors.

⁶ Cf. M. GENSLER, “The Concept of *Spiritus* in Walter Burley’s *Parva naturalia* Commentaries,” *Homo — Natura — Mundus: Human Beings and Their Relationships. Proceedings of the*

by no means a complete study of all functions performed by the *spiritus*; some of them are discussed in greater detail, while some others are barely sketched. Frequently, its character corresponds to the form and execution of a particular commentary. It is easy to notice that his favourite topics are: digestion, activity and rest, the working of external and internal senses, and bodily motion.

What is the *spiritus*? It would be difficult to say that Burley treats it as a tissue on a par with bones, muscles, nerves, and veins, because he frequently speaks of it as something present or absent in them. The only other bodily substance that is similar to it is blood. They are both produced in an animal's heart (in those which have a heart) or in something analogous to it (in those which have not) from the digested food.⁷ They are both hot, but the *spiritus* is hotter, because it is composed of aerial and fiery elements, while blood, which is a liquid, must possess a watery component, too. They both penetrate all living bodies as long as they are alive, but Burley never says that blood is a vehicle of the *spiritus*.⁸ There are certain passages, in which he speaks of it as being transported through the nerves.⁹ This shows that it is more ubiquitous in the body than blood. Consequently, one can surmise that the *spiritus* is the only bodily substance that is engaged in all actions of the body. In practice, this means that it is responsible both for the original animation of living creatures and their continued existence in all phases of life.

XIV Congress of SIEPM, edited by R. Hofmeister Pich, A.C. Storck, A.S. Culleton, Turnhout: Brepols, 2020, p. 805–816.

⁷ GUALTERUS BURLAEUS, *Commentarium in De somno et vigilia*, cap. 6, V, f. 96vb: “Cor igitur est principium expirationis et inspirationis, et hoc in habentibus sanguinem. Et in non habentibus sanguinem est aliquid proportionale cordi principium. Licet enim in talibus non fiat aeris respiratio per partem determinatam, in ipsis tamen est spiritus complantatus per poros corporis ad infrigidandum calorem existentem circa membrum id quod est proportionale cordi. [...] Aliter tamen dicunt aliqui de animalibus sanguinem non habentibus quod illa sunt frigidiora animalibus sanguinem habentibus.”

Cf. *Ibidem*, Qu. 14 *Utrum cor sit principium sanguinis*, corpus quaestionis, V, f. 101vb: “Quod autem cor sit principium caloris, spiritus et motus patet, quia per Philosophum cor est principium quod primo vivit et quod ultimo morietur, sicut dicitur in *De morte et vita*, sed vita stat per calidum et humidum; igitur in corde est primum principium caloris. Quod sit principium spiritus patet per auctorem *De differentia spiritus et animae* qui dicit quod spiritus vitalis in corpore oritur a corde. Quod cor sit principium motus probatur libro *De motibus animalium*.”

⁸ *Ibidem*, Qu. 3 *An somnus et vigilia insint plantis*, ad 4, V, f. 91rb: “Ad cuius intellectum sciendum quod anima tam in nutriendo, quam in sentiendo indiget calore et spiritu tamquam instrumento. Spiritus enim, ut dicit Albertus, est corpus aereum in substantia, lucidum, spissum et diaphanum.”

⁹ *Ibidem*, cap. 7, V, f. 99ra: “Intelligendum est quod evaporationes ad cerebrum elevatae et ibidem infrigidatae 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.”

The ubiquity of *spiritus* seems to result from its nature; since it is fiery and aerial, it is not only the most delicate but also the lightest of all bodily substances. This means that by its nature it tends upwards and moves down only when it is cooled. From the heart, which is the hottest organ of the body, where it is generated, it raises to the brain, the coldest organ, and animates it. In this process, it is cooled down and becomes heavier, which results in its descent back to the centre of the body.¹⁰ Apart from this natural convection, there are also other, more complex motions of the *spiritus*, in which it seems to be pushed or pulled hither and thither by various tissues or organs. Since its amount in the body is limited by its nature, it has to be transferred from one part to another whenever there is work to be done by it.¹¹ For instance, the stomach requires large quantities of the *spiritus* to digest food, because it provides the heat necessary to destroy the form of digested matter. This is why after a meal we feel drowsy, because the *spiritus* has been revoked from the brain and limbs to perform its action in the stomach.¹² Generally, Burley observes that whenever the *spiritus* is revoked from a part of a body, it becomes inactive or its action is debilitated.

Let us start with the analysis of the role of the *spiritus* in the vegetative processes. Following Aristotle, he mentions four such processes, viz. digestion, purification, growth, and sexual activity of males and females. It has already been said that the *spiritus* is needed for the destruction of the form of food in the stomach. It is also engaged in its transformation into the matter proper for the body, i.e. moistness and heat, which serve as its nourishment. They are not identical with the radical humidity and natural heat of the organism, but they provide material that partly replenishes their loss and, in young organisms, builds the new tissues of the growing body. Burley clearly distinguishes between the radical humidity and natural heat of the organism and those

¹⁰ *Ibidem*.

¹¹ *Ibidem*, cap. 7, V, f. 100ra: “Et ex istis infertur definitio somni. Et est quod somnus est conventus caloris ad interius et eiusdem naturalis reciprocatio propter causam praedictam, scilicet propter evaporationes frigiditate cerebri condensatas descendentes modo prius dicto. Intelligendum est quod somnus non est conventus caloris interius, sed est impotentia sentiendi causata ex conventu caloris ad interius facta propter causam dictam.”

Cf. *Ibidem*, cap. 8, V, f. 100rb: “Solutio Philosophi est ista quod vapor calidus elevetur sursum ad cerebrum et ibi infrigidatur et condensatur, et tunc descendit propter gravitatem et repellit calorem naturalem ad interius, et tunc cessant sensus exteriores ab actu sentiendi, quia non sentiunt absque calore. Unde et calidum est causa somni et etiam frigidum, quia vapor in principio, quando ascendit, est calidus, sed postea, quando descendit, est frigidus.”

¹² *Ibidem*, cap. 8, V, f. 100va: “Intelligendum est quod humiditas ascendens a loco digestionis ad caput per venas cerebri infrigidata descendit et repellit calorem et spiritum ad interiora, ita quod sunt in minori loco quam prius, et tunc repulso calore et spiritu fit somnus.”

which are produced in the process of digestion.¹³ Radical humidity and natural heat are inborn in the quantity that is, first of all, characteristic for various species of plants and animals but is also proper to each individual. In humans, for instance, it can be seen that the differences between the amount of radical humidity and natural heat establish their individual proportion, which is reflected in the humoral complexion. This, in turn, defines the temperament of an individual as either sanguine, choleric, phlegmatic, or melancholic.¹⁴ Because the quality of the heat and moisture coming from food is worse than the ones which are innate, the replenishment of lost natural heat and radical humidity can never be complete.¹⁵ This means that during the lifetime of an individual they are gradually depleted and, when one of them is finally extinguished, the organism dies.

Burley is silent about the role of the *spiritus* in transporting the nourishment within the body; he only mentions that this is done by the blood. We can surmise that it is engaged in stimulating the blood flow. The whole process of digestion has several phases: first the food reaches the stomach, where its original form is destroyed, then it is moved to the liver, where the nourishment is transformed into inchoate blood, which finally moves to the heart, in which it gets its perfect form. All these processes require heat, which, in all probability, is provided by the *spiritus*.¹⁶ Burley is more vocal about the *spiritus*'s role in purification of blood from the waste brought by it from tissues and organs. This process is presented as requiring a lot of the *spiritus*, which has to be revoked from other organs for that purpose. As it was the case with digestion, Burley notes that such

¹³ GUALTERUS BURLAEUS, *Commentarium in De longitudine et brevitae vitae*, Qu. 3 *Utrum vivens possit perpetuari per totum tempus manens unum et idem numero*, corpus quaestionis, V, f. 238va: "Dicendum est quod calidum naturale aliquam deperditionem facit in humido radicali, sicut ignis existens in lychno semper facit aliquam deperditionem, ita quod continue aliquid deperditur de lychno et numquam potest tantum humidum vel tanta pinguedo apponi lychno, quin manente igne fiat continua deperditio lychni, et sic est ex parte ista, nam ad restaurandum humidum radicale advenit humidum nutrimentale. Illud tamen humidum non sufficienter restaurat, quia illud humidum nutrimentale non est naturale omnino ei sed aliquo modo innaturale, ideo continue appositum sibi continue ipsum debilitat. Sed aliquo modo restaurationem facit, sed non restaurat sufficienter, quia debilitat, et ideo necessarium est aliquando animal corrumpti."

¹⁴ M. GENSLER, M. MANSFELD, "The Mechanism for Sustaining Life in Walter Burley's *Parva naturalia* Commentaries," *A Question of Life and Death: Living and Dying in Medieval Philosophy. Acts of the XXIII Annual Colloquium of the Société pour l'Étude de la Philosophie Médiévale, Leuven, 10–12 October 2018*, edited by J.-M. Counet, Turnhout: Brepols, 2022, p. 131–143, esp. 133–138.

¹⁵ Cf. note 11.

¹⁶ M. GENSLER, "The Concept of *Spiritus* in Walter Burley's *Parva naturalia* Commentaries," p. 806–807.

revocation is accompanied by the feeling of drowsiness, which is a consequence of dearth of the *spiritus* in the brain.¹⁷

In discussing the growth of the body, Burley mentions several phases: gestation, infancy, and young age. The development of the foetus is dependent on nourishment provided by the *spiritus* from mother's blood. Apparently, he believes that blood can carry the greatest amount of the *spiritus* and, for this reason, the pace of growth of the foetus is the fastest. Infants receive nourishment in the form of milk, also highly saturated with the *spiritus*, but in such proportion to other nutrients that is perfectly suited for their development.¹⁸ That is why infants should be fed with milk only and not with other kinds of drink that contain more *spiritus*, like wine. Moreover, even wet-nurses should avoid drinking too much wine, lest it adversely affects the composition of milk.¹⁹ In young age, children's bodies grow fast thanks to the fact that their greater humidity provides a suitable patient for the intensive activity of heat, transported around the body by the *spiritus*.²⁰ At this stage, more matter is acquired by the body than wasted.

Reproduction is treated by Burley as a vegetative physiological process, characteristic for plants and animals alike. It occurs only when there is a surfeit of heat and, consequently, the *spiritus* in the bodies of reproducing individuals (he seems to be sceptical about the reproductive capacity in the periods of famine). The examples he gives refer only to animals, to tell the truth, mostly to human beings. For this reason, the distinction into male and female sex comes

¹⁷ GUALTERUS BURLAEUS, *Commentarium in De somno et vigilia*, Qu. 12 *Utrum vapor nutritivus sit causa somni effectiva*, corpus quaestionis, V, f. 100vb–101ra: “Unde dicit Philosophus quod completa digestionem et vigorato calore prius ad intrinsicum repulso et separato sanguine puro ab impuro expurgescuntur animalia et evigilant.”

¹⁸ *Ibidem*, Qu. 13 *Utrum pueris noceat bibere vinum vel quod suae nutrices bibant vinum*, corpus quaestionis, V, f. 101rb–101va: “Similiter, quod lac sit nutrimentum pueris patet, quoniam ex eisdem sumus et nutrimur. Sed foetus fit ex sanguine menstruoso et ex eodem in utero nutritur. Sed post generationem foetus sanguis menstruus in corpore mulieris mittitur ad mamillas et convertitur in lac. Et ideo conveniens est quod pueri nutriantur lacte ex quo parum differt a sanguine menstruoso quo nutriebantur in utero.”

¹⁹ *Ibidem*, cap. 7, V, f. 99vb: “Ex praedictis concluditur corollarie quod pueris non confert bibere vina nec multum evaporantia nec confert pueris quod nutrices bibunt vina; et parum differt pueris aut nutricibus evaporantia conferre.”

²⁰ *Ibidem*, cap. 7, V, 99va: “Quartum signum quod somnus causatur ex evaporatione ascendente ad superiora est quod pueri qui constituti sunt in prima aetate magis dormiunt quam quando sunt in alia aetate. Hoc enim est, quia in pueris est multa humiditas et etiam caliditas quae sunt causae evaporationis; et hoc est signum quod evaporatio est causa somni. Quod autem in pueris sit multa evaporatio nutrimenti delata sursum probatur per quoddam signum. Et est quod in tali aetate membra superiora (ut caput et manus) crescunt magis quam membra inferiora (ut sunt pedes vel tibiae). Hoc non est nisi propter maiorem ascensum nutrimenti sive vaporis a nutrimento ad partes superiores.”

to the centre. The starting point is the established belief, originating in Galen rather than Aristotle, that women are relatively humid and cold, whereas men are relatively hot and dry.²¹ The explanation is related to the view concerning the role played in reproduction: women are passive and provide matter for the generated offspring, while men are active and provide form. On closer look, one can see more complexity in the picture. It involves two phases: sexual intercourse and gestation. In sexual intercourse, the role of the female is limited to providing matter, i.e. menstrual blood (hotter than normal blood and thus being a more suitable environment for gestating life), which receives the semen from the male. Semen is produced by males through rarefaction of blood by the *spiritus*.²² This makes it particularly hot and, therefore, active and apt to carry the specific form. The production and delivery of semen to the womb of the female ends the male's action in the process of reproduction. The second phase, gestation, takes place in the womb. The foetus first develops by being animated by the vegetative soul of the mother as if it were an extra organ of a female body, nourished by blood,²³ and only later achieves its own individual characteristics thanks to the action of the specific form transmitted by the semen.

The surfeit of heat and the *spiritus* in women may result in processes that are not directly related to reproduction. One, more obvious, result is production of milk by lactating women: Burley thinks that milk is generated from more subtle parts of menstrual blood. A less obvious result occurs when still more subtle parts of blood saturated with the *spiritus* go up all the way to the eyes and, emitted by them, they infect the surrounding air. This can be seen, for instance, on the surfaces of mirrors, which become stained (in agreement with Aristotle), but also in young men, who happen to be close to such women, if they intend to

²¹ GUALTERUS BURLAEUS, *Commentarium in De longitudine et brevitate vitae*, cap. 4, V, f. 235vb: "Dicamus quod declaratum est in quarto *Meteororum* quod generatio est, quando virtutes activae dominantur in generatione super passivas, et quod corruptio accidit e converso, quando scilicet virtutes passivae dominantur super activas. Et hoc fit ita, quando calor mensuratus cum frigore dat generato formam propriam naturalem, immo haec est illa forma, et humiditas mensurata cum siccitate recipit formam propriam."

²² GUALTERUS BURLAEUS, *Commentarium in De somno et vigilia*, Qu. 18 *Utrum mulier menstruata inficiat speculum*, corpus quaestionis, V, f. 105va: "[...] [C]um nutrimentum ingreditur corpus, convertitur et digeritur per calorem, et aliquando convertitur plus de nutrimento quam sit necessarium ad restaurandum deperditum vel ad augendum, et tunc contingit quod caliditas excellens in viris convertat illud superfluum in semen mittens illud ad vasa seminum. Sed, quia caliditas in mulieribus non est tanta, ut possit convertere illud superfluum in semen, convertit ipsum in sanguinem menstruum."

²³ GUALTERUS BURLAEUS, *De formis*, in: *Walter Burley's Treatise "De formis"*, edited by F.J. DOWN SCOTT, Munchen: Verlag der Bayerischen Akademie der Wissenschaften, 1970. Cf. M. GENSLER, *Kłopotliwa zmiana, czyli Waltera Burleya zmagania ze zmiennością rzeczy*, Łódź: Uniwersytet Łódzki, 2007, p. 145.

harm them. The men then become ill behaved, sick, and can even die due to fascination caused by the emitted *spiritus*.²⁴ Burley notes that this phenomenon is not limited to human species but can be observed in other animals, too.

The other operating theatre of the *spiritus* is found in the actions of the sensitive soul. They are divided into two main groups: cognitive processes and motoric actions. The first group is not only big but also pretty complex in structure, because it comprises processes related to sensitive cognition coming from five external senses, processes involving five internal senses, and relations between external and internal senses. The second group covers motions treated as voluntary, involuntary or non-voluntary ones on the one hand and analysed as being the effect or the cause of changes occurring in the senses on the other one.

Perception involving five external senses is varied as to the genera of qualities of the objects of sensory cognition. Strangely enough, its physiological nature seems to be quite uniform for Burley. No matter whether we watch a picture, taste a cake, smell a flower, hear a song or stroke a cat, the sensations which occur in a particular organ have to be transmitted as sensible species into the brain,²⁵ where they are processed by internal senses. As can be expected, the *spiritus* has an important role to play both in receiving the species and in transporting them.²⁶ What is important to note is that this is a very special kind of the *spiritus*, much subtler and less dense than the one involved in vegetative processes. It is also dispersed throughout the body in another way than the “vegetative” one. The “vegetative” *spiritus* is gross in nature and thus it has to be transported by the veins, wide enough to transport both the *spiritus* and the blood,²⁷ while the “sensitive” one fits alone in much narrower and more delicate

²⁴ GUALTERUS BURLAEUS, *Commentarium in De somno et vigilia*, Qu. 18 *Utrum mulier menstruata inficiat speculum*, corpus quaestionis, V, f. 105vb: “Et per similem modum contingit fascinatio, nam, cum mulier vel aliqua vetula imaginatur fortiter ad maleficium alicuius pueri, causatur humor grossus et turbidus circa locum imaginationis illius mulieris, et illud quod est subtilius illius humoris mittitur superius ad oculos. Et illud tunc evaporans inficit aerem continue usque ad puerum vel pueros quorum corpora sunt valde passibilia; et ex hoc contingit mors vel infirmitas ex fascinatione. Et hoc modo oculus lupi reddit hominem raucum et oculus alicuius animalis hoc modo interficit hominem.”

²⁵ *Ibidem*, cap. 10, V, f. 103vb: “Et sicut est de visu, sic est de aliis sensibus quod universaliter species sensibilis manet in sensu in absentia sensibilis.”

²⁶ *Ibidem*, cap. 7, V, f. 99rb: “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.”

²⁷ *Ibidem*, Qu. 3 *An somnus et vigilia insint plantis*, ad 4, V, f. 92rb: “Sed alius est spiritus quo anima utitur nutriendo, quia est grossus et multum unitus. Sed spiritus quo utitur sentiendo est magis subtilis et magis dispersus in plura, sicut organa sensuum divisa sunt.”

nerves, which also penetrate the body but play another role. The veins principally serve nutritive purposes, while the nerves transport the sensitive species.

The paths of the nerves are also different from the paths of the veins and so is the circulation of the *spiritus* along them. The most important links are the ones between the organs of external senses and the brain, and between the brain and the muscles responsible for motoric functions.²⁸ Because these links are served by the delicate “sensitive” *spiritus*, their *modus operandi* cannot be as simple as that of the veins. While the veins transport blood and the *spiritus* continuously, so that all tissues and organs of the body receive nourishment without any break, the nerves, which transport the “sensitive” *spiritus*, can function in pulses, transporting the *spiritus* only when an action of a sense organ or a muscle occurs. Such functioning of the “sensitive” *spiritus* results in periodical accumulation or scarcity of it in the organs of sense or muscles.²⁹

Burley’s description of the role of the *spiritus* is almost mechanical. Because of its fiery-aerial nature, it can be easily condensed or rarefied. These two processes, in turn, translate into the pushing and pulling motions of the organs and limbs.³⁰ An outward push of the *spiritus* increases hotness in a body part

²⁸ It is visible from Burley’s treatise on sensual cognition, *De sensibus*, which does not belong to the *Parva naturalia* set but is thematically close to it. In the case of the present text, we are providing a semi-critical edition based on three manuscripts out of ten or so that have been consulted. GUALTERUS BURLAEUS, *De sensibus*, Cambridge, Cambridge University Library, MS Hh IV 13, ff. 59v–60r; London, Lambeth Palace Library, MS 70, f. 117va; Vatican, Bibliotheca Vaticana, MS Vat. lat. 2151, f. 118va: “Unde manifestum est ex istis pro sensibus exterioribus quod visus non est in oculo, sed interius in anteriore parte cerebri in concursu duorum nervorum ad duos oculos protensorum. Nec auditus est in aure, sed interius infra aerem connaturalem colligatum in quadam pellicula in cerebro. Odoratus est in anteriori parte cerebri infra telam praedictam supra visum. Isti tres sensus sunt in cerebro. Gustus non est in carne linguae, sed interius in quodam rete tenui et subtili in ipsa lingua. Tactus vero non est immediate in carne, sed in quodam rete huiusmodi quasi per totum corpus extenso. Isti autem duo sensus angulariter sunt in corpore, alii autem tres angulariter sunt in capite.” Cf. M. MANSFELD, “The World of Senses: On the Process of Cognition in Walter Burley,” *The Development of Aristotelian Psychology and Physiology in Medieval Europe between 1200 and 1420*, edited by M. Gensler, M. Mansfeld, M. Michałowska, Cham: Springer 2022, p. 229–251.

²⁹ GUALTERUS BURLAEUS, *Commentarium in De motu animalium*, cap. 5, V, f. 243ra: “[Avicenna] Dicit etiam *Sexto Naturalium* quod, si aliquis incederet super trabem sursum positam, ex imaginatione magna casus statim et subito cadit. Si tamen ille idem incederet super eandem trabem positam super terram, non caderet, quia non imaginaretur casum.”

³⁰ *Ibidem*, cap. 7, V, f. 243vb: “Primum movens organice sit spiritus: quia movens organice debet esse tale quod possit moveri a movente principali et quod habeat virtutem movendi alia de facili et sine violentia. Motus autem quo moventur animalia motu progressivo est motus pulsus et tractus. In motu autem pulsus oportet quod movens impellat a se ad aliud, in motu tractus oportet quod ab alio trahat. Quare manifestum est quod in utroque motu oportet movens organice esse coniunctum moto principali immobili, sed hoc non potest esse, nisi illud movens posset augeri et diminui per condensationem et rarefactionem, quia non potest coniungi cum immobili et pellere,

and an inward pull, conversely, increases coldness in it. Burley is convinced that even a small alteration in the principle of motion, that is the heart which is the source of the *spiritus*,³¹ results in a visible change in the limbs. The results of such actions can be seen, for instance, on people's faces when they blush or become pale; he explains these two processes as either a sudden push of the *spiritus* from the heart to the outside caused by physical exertion or anger, or pulling it back to the inside caused by weakness or fear.³²

What is now interesting is the way in which these actions of the *spiritus* are triggered. In his report, Burley is following closely the opinion of Aristotle that motions in animals have two directions. Some start in body parts and move to the centre, some go the other way round. The former refer to the motion of perception originating in the sensory organs that terminates in the brain, which is the site of the internal senses, such as the common sense and phantasy, the latter originate in the brain and terminate in other parts of the body. In fact, we can speak of chain reactions, when the brain, first stimulated by a sense perception, in turn activates another limb or organ.³³ In humans, the practical intellect is another ultimate principle of local motion beside phantasy. The whole process is described as follows. The sense is stimulated — altered — by the object in such a way that a sensible species is produced. As has been already mentioned, Burley does not distinguish between various senses but what he says allows one to conclude that a sensible species has the virtue of being hot or cold. This

nisi rarefiat, nec trahere, nisi condensetur. Sed spiritus est huiusmodi, potest enim faciliter et sine violentia condensari et similiter rarefieri, nam habet gravitatem et levitatem secundum quod comparatur ad diversa et habet ista non alteratione sed compositione.”

³¹ *Ibidem*, cap. 7, V, f. 243vb: “[...] Declarat in quo primo invenitur spiritus et dicit quod in corde vel iuxta cor, quia spiritus est movens motum, et accipit principium movendi a principali movente, et ideo oportet quod coniungatur cum principali movente, et principale movens est in corde; ergo et cetera.” Cf. also M. GENSLER, “The Concept of *Spiritus* in Walter Burley’s *Parva naturalia* Commentaries,” p. 806.

³² *Ibidem*, cap. 5, V, f. 243ra: “Postea dicit Philosophus quod modica alteratione facta in principio fit maior diversitas in aliis partibus, ut gubernaculo navis transmutato secundum positionem fit magna transmutatio navis et partium navis, quia gubernaculum habet rationem principii. Similiter, modica alteratione facta in corde vel circa cor ad caliditatem vel frigiditatem fit magna et multa diversitas in partibus exterioribus. Si enim cor alteretur ad frigiditatem, removetur calor et spiritus ab exterioribus ad interiora et remanent partes exteriores frigidae, et tunc fit pallor, et quandoque tremor et timor. Si autem cor alteretur ad caliditatem, tunc mittuntur calor et spiritus ad exteriora, et fit rubor.”

³³ *Ibidem*, cap. 8, V, f. 244ra: “Postea dat Philosophus modum motus in animalibus. Et dicit quod rationaliter motus quandoque fiunt a partibus ad principium et quandoque e converso, ita quod motus aliquando incipit a partibus et terminatur ad principium, sicut contingit in alteratione sensus (alterationes autem sensuum exteriorum terminantur ad cor), et quandoque incipit motus a principio et terminatur ad istas partes (nam facta alteratione in corde alterantur et aliae partes). Aliquando incipit motus ab una parte et tendit in aliam partem vel ad eandem. Aliquando enim incipit motus a visu et ex hoc movetur cor et ex motu cordis alteratur visus vel auditus.”

makes it possible for him to simplify the explanation of the process to movements of heat, transported by the *spiritus*, first from the senses to the brain, and then, thanks to the action started by phantasy, from the brain to the limbs. At this stage, he does not go into the details concerning the role of the intellect; he merely mentions that its role is the same as that of phantasy.³⁴ He does state, however, that in the sequence of actions involved in producing local motion we can enumerate several interlocking alterations, which start in the external senses, then move to the internal ones and, finally (in man), to the intellect and will, which are acted upon in a similar way. Local motion as such occurs at the end of this sequence.³⁵

In describing the movement of the *spiritus* to the brain and from it, Burley makes an important distinction. He observes that, while the motion originating in the sense is triggered by contact with the object that produces heat or coldness, the role of heat and coldness as agents in the *vis aestimativa*, being one of the internal senses, is related to the sensations of pleasure and displeasure, respectively. Being pleasant is associated with a warm sensation; it activates both cognition and desire, which function as principles of action in animals. What is sensed as pleasurable is, by the same token, desirable. By contrast, being unpleasant, associated with a cold sensation, gives an adverse stimulation making it difficult to perform or effectively preventing an action of an individual, because the *spiritus* required for performing it has been withdrawn. Burley does not

³⁴ *Ibidem*, cap. 5, V, f. 242vb: “[...] Motus animalis fit per alterationem partium animalis, nam eadem pars fit maior et minor, et permutatur eius figura per extensionem et retractionem — ad extensionem movetur per caliditatem, ad retractionem per frigiditatem. Causam alterationis ad caliditatem et frigiditatem assignat Philosophus dicens quod principia alterantia ad caliditatem et frigiditatem sunt sensus et phantasia et intellectus in actu. Et illud declarat Philosophus per rationem et per experimentum. Per rationem sic: sensus fit in actu per hoc quod recipit speciem sensibilem, sed species sensibilis habet consimilem virtutem qualem habet sensibile; et ideo, sicut calidum potest alterare ad caliditatem, ita et species calidi. Et ideo, si sensibile immutans sensum fuerit calidum vel frigidum, sensus habens speciem illius sensibilis habet virtutem alterandi corpus ad illa. Et eadem est ratio de phantasia et intellectu, quia sunt tales virtutes quales res sensibiles extra sunt in actu. Unde, quando aliqua sunt ordinata essentialiter, ita quod unum agit in virtute alterius, secundum retinet virtutem primi, sicut patet in semine quod est virtus hominis.”

³⁵ *Ibidem*, cap. 4, V, f. 242ra: “In animalibus motus localis est posterior, et hoc via generationis. Et ratio est: quia animal non movetur localiter, nisi prius facta alteratione in partibus corporis vel per sensum vel per phantasiam. Cum enim sensus alteratur, provenit alteratio usque ad phantasiam. Phantasia autem alterata movetur intellectus, et similiter appetitus vel voluntas. Et tunc alteratur aliqua pars corporis quae primo movetur, et tunc movetur animal. Et sic manifestum quod motus localis est finis alterationis, et ideo est ultimus via generationis omnium motuum qui fiunt in animali, licet sit prior secundum substantiam et perfectionem.”

show how sensations are linked with passions; he seems to treat the sequence: warm — pleasant — desirable as obvious.³⁶

As has been said, Burley distinguishes three types of motion: voluntary, involuntary, and non-voluntary. The examples he gives suggest that non-voluntary motions concern the actions triggered by the vegetative part of the soul, since he mentions sleep and breathing among them. The involuntary motions, the second group, are ones that are hardly controllable by the will, like, for instance, sexual arousal resulting in erection, but also fear, which causes trembling of hands and legs. In such motions, the will seems to be bypassed, probably because the movement of the *spiritus*, bringing in the increase or decrease of heat that is the immediate cause of the change in the organ, is very swift. He stresses that such “independent” alterations are usually related to actions of the heart and the genitals and explains that Aristotle himself noticed that phenomenon and for this reason called both organs quasi-animals.³⁷ Voluntary motion, the third type, is the one caused by flexing and relaxing the muscles as a result of impulses coming from the brain and steered by the practical intellect in humans and the *vis aestimativa* in other animals.

In discussing the role of the *spiritus* in functions performed by the vegetative and sensitive parts of the soul, one important thing has to be stressed. It has already been said that the amount of the *spiritus* in the body does not allow it to perform all of its functions at once. Accordingly, it has to move to and fro, and the parts from which it has been revoked become inactive or, at least, less active. Here we encounter an interesting question of the “division of labour” between the vegetative and sensitive functions and, consequently, the problem of activity

³⁶ *Ibidem*, cap. 5, V, f. 243ra: “[...] Sensus et phantasia et intellectus habent virtutem alterandi corpus ad caliditatem et frigiditatem, et hoc sic: primum principium motus est appetibile et fugibile quae oportet meditari antequam moveatur animal. Et meditationi eorum sequitur caliditas vel frigiditas, nam omnia delectabilia et tristabilia fere sunt cum caliditate et frigiditate. Et hoc patet: ex passionibus audaciae enim et timoris, concupiscentia et cetera talia delectabilia et tristabilia sunt cum caliditate et frigiditate; ergo et cetera.”

³⁷ *Ibidem*, cap. 8, V, f. 244ra: “Postea declarat Philosophus de causis motuum involuntariorum. Quidam enim sunt motus voluntarii et quidam involuntarii et quidam non-voluntarii. Motus non-voluntarii sunt somnus et vigilia, inspiratio et respiratio. Motus involuntarii sunt qui sunt contra imperium voluntatis, qui non fiunt mediante aliquo appetitu animali vel intellectuali sed mediante aliquo appetitu naturali, sicut viso aliquo delectabili fit motus in genitalibus contra imperium voluntatis, et huiusmodi motus fiunt ab extrinseco continente. Ex hoc videtur quod, quando species alicuius delectabilis vel tristabilis recipitur in sensu vel phantasia vel in alia potentia animae, alterantur partes animalis ad calidum vel ad frigidum, et secundum hoc dilatantur vel diminuuntur. Et inter partes animalis partes quae magis notabiliter moventur isto motu sunt cor et genitalia. Et rationem huius assignat Philosophus: quia utrumque illorum est quasi animal per se.” For more information on the role of *spiritus* in the actions of the sensitive soul, see: M. GENSLER, “Walter Burley on Voluntary and Involuntary Motion in Man,” *Przeegląd Tomistyczny*, vol. 28 (2022), pp. 193–207.

and rest. According to Burley, the body is active all the time, but in animals we can see a specialisation: daily activity, or, to be more precise, waking activity is the time, in which the sensual part has a visible priority in using the *spiritus*; nightly activity, in turn, is the time when priority is shifted to the vegetative part that can use it for digestion, purification, and growth (Burley is convinced that we grow when we sleep).

Why is this so? Burley realises that while the vegetative activity alone does not require rest (plants do not sleep), the activity of sense organs spends a lot of the “sensitive” *spiritus* and that, sooner or later, results in the exhaustion of the organ. When the daily activity of a human individual is intense, tiredness sets in as a consequence of a big loss of the *spiritus*. Sleep, which is a result of such tiredness, is a natural state of relax which the organism needs for sustaining its well-being. It is a process regulated by both psychological and physical causes.³⁸ It is caused by tiredness resulting from cognitive³⁹ or physical activity⁴⁰ of the organism, but also by the need to perform a vegetative action, such as digestion.⁴¹ In the first two cases, the immediate cause of sleep is the depletion or retraction of *spiritus* and heat:⁴² depletion through work and retraction as a result of a psychological activity requiring a greater condensation of *spiritus*

³⁸ Cf. GUALTERUS BURLAEUS, *Commentarium in De somno et vigilia Aristotelis*, Qu. 5 *An somnus prius insit animali quam vigilia*, corpus quaestionis, V, f. 94rb: “Unde secundum Albertum quattuor sunt causae somni, duae ex parte animae et duae ex parte corporis. Et ex quacumque causa accidit somnus, semper vigilia praecedat somnum.”

³⁹ Cf. *Ibidem*, Qu. 5 *An somnus prius insit animali quam vigilia*, corpus quaestionis, V, f. 94va: “Alia causa huius immobilisationis ex parte animae est profunda cogitatio. Quando enim homo profunde cogitat, calor et spiritus trahuntur ad interius ad confortandum cogitativam, et tunc immobilitantur sensus exteriores, et fit somnus.”

⁴⁰ Cf. *Ibidem*, Qu. 5 *An somnus prius insit animali quam vigilia*, corpus quaestionis, V, f. 94va: “Ex parte corporis sunt duae causae. Una: labor corporalis, nam per laborem corporalem fit maxime consumptio et debilitatio et deperditio spirituum, et nisi esset confortans eos, totaliter deficerent et moreretur animal. Et ideo calor et spiritus trahuntur ad interius per laborem corporalem. Alia causa ex parte corporis est evaporatio nutrimenti.”

⁴¹ Cf. *Ibidem*, Qu. 5 *An somnus prius insit animali quam vigilia*, corpus quaestionis, V, f. 94rb: “Una causa est digestio nutrimenti, nam anima revocat spiritus ad interius tempore et loco digestionis, et spiritus retracti ad interius calefaciunt partes interiores et confortantur digestio, et ex illa retractione contingit immobilitatio sensuum exteriorum, et tunc fit somnus.”

⁴² Cf. *Ibidem*, cap. 7, V, f. 99rb: “Ideo non omnis impotentia sentiendi est somnus, sed illa quae causatur ex evaporatione facta ex nutrimento, nam calido agente in nutrimento circa locum digestionis necesse est fieri evaporationem. Et illud, quod evaporatum est virtute calidi, propellitur sursum ad cerebrum et in frigiditate cerebri infrigidatur et ingrossatur et descendit et impedit influxum virtutis a sensu communi ad sensus exteriores, et fit somnus.”

Cf. *Ibidem*, cap. 7, V, f. 99rb: “Quod somnus causatur ex evaporatione facta ex nutrimento et qualiter hoc sit, dictum est. Intelligendum est quod evaporationes ad cerebrum elevatae et ibidem infrigidatae 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

and heat in the brain; in the third case, the goal of the retracted *spiritus* is the stomach.⁴³

Burley identifies two phases of sleep, both engaging the *spiritus*. In the first one, the *spiritus* is revoked from outlying organs to accompany natural heat in the process of digestion — this revocation causes drowsiness. In the second phase, digestion produces new *spiritus*, which — as a hot vapour — ascends to the brain, where it is cooled and descends back causing sleep. The objective of this motion is to purify the blood from toxic substances. Once the blood is purified, an animal wakes up, because the *spiritus* can be used again by other organs.⁴⁴

Even in sleep, however, the senses are not altogether inactive (and so, completely deprived of the *spiritus*), as is testified by dreams originating in phantasy.⁴⁵

Putting everything together, we can conclude that Burley's vision of the role of the *spiritus* as animating principle is all-encompassing. Such a vision is hardly original, nevertheless, he is quite skilful in its application in various contexts, both those envisaged by Aristotle and the ones added later by earlier scholastics. He is able to claim that except for intellectual activity, which does not require any bodily organ, the *spiritus* is active in everything, everywhere and always, though not always and everywhere at the same time. For these reasons, it can be truly called the substance of life.

sensuum exteriorum, et tunc impediendo influxum sensus communis ad sensus exteriores causatur somnus.”

⁴³ Cf. *Ibidem*, qu. 5 *An somnus prius insit animali quam vigilia*, corpus quaestionis, V, f. 94va: “Sic igitur patet quod vigilia semper praecedit somnum, quia universaliter somnus fit ex retractione caloris et spiritus ad interius, et quod retrahitur ab aliquo, praexistit in illo; igitur ante somnum in organis exterioribus erant spiritus et calor, sed vigilia non est nisi praesentia caloris naturalis in sensibus exterioribus; igitur etc.”

Cf. *Ibidem*, cap. 7, V, f. 99ra: “Quinto supponitur quod cum nutrimentum ingreditur ab extrinseco ad loca digestiva, ut ad stomachum, hepar, fit quaedam evaporatio a nutrimento usque ad venas, per quas differtur.”

⁴⁴ M. GENSLER, M. MANSFELD, “The Physiology of Divination in Walter Burley,” *Przegląd Tomistyczny*, vol. 25 (2019), p. 436–437. Cf. GUALTERUS BURLAEUS, *Commentarium in De somno et vigilia Aristotelis*, cap. 8, V, f. 100rb: “Solutio Philosophi est ista, quod vapor calidus [elevetur] <elevatur> sursum ad cerebrum et ibi infrigidatur et condensatur, et tunc descendit propter gravitatem et repellit calorem naturalem ad interius, et tunc cessant sensus exteriores ab actu sentiendi, quia non sentiunt absque calore. Unde et calidum est causa somni et etiam frigidum, quia vapor in principio, quando ascendit, est calidus, sed postea, quando descendit, est frigidus. Et ideo causa proxima et immediata somni est vapor infrigidatus et causa remota est vapor calidus, sicut patet de vapore elevato per caliditatem Solis: ille vapor in principio est calidus, sed postea, cum venerit ad locum frigidum in aere, infrigidatur et ingrossatur, et tunc descendit, et est causa pluviae vel nivis. Unde quando in animali non possunt vapores per calorem ulterius elevari, descendunt et repellitur calor naturalis, et tunc vadunt animalia et homines declinando a statura recta propter repulsionem caloris naturalis.”

⁴⁵ For more information concerning sleep, dreaming, and divination see: M. GENSLER, M. MANSFELD, *The Physiology of Divination in Walter Burley*, p. 429–443.

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WALTER BURLEY ON THE *SPIRITUS* IN THE *PARVA NATURALIA* COMMENTARIES

SUMMARY

The concept of the *spiritus* employed by Walter Burley, an English philosopher active in the first half of the fourteenth century, in his commentaries on the *Parva naturalia* set is presented in a scholarly manner, drawing on the numerous sources available for Latin thinkers of his times. Burley analyses the character of the *spiritus*, its origin, and numerous functions it plays in living organisms. He distinguishes between the functions it plays with respect to the vegetative actions of bodies and the ones concerning the sensitive and motor actions. He also pays attention to the interesting issue of activity and rest as periods in which one or the other functions are given priority by the organism.

KEYWORDS: aristotelianism, medieval philosophy of nature, medieval physiology, medieval psychology, Walter Burley

SŁOWA KLUCZE: arystotelizm, średniowieczna filozofia przyrody, średniowieczna fizjologia, średniowieczna psychologia, Walter Burley