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HABITUS OR THE POSSIBILITY OF SCIENCE OF THE CONTINGENT*

Among Aristotle's many contributions to the development of civilization his contributions to the development of science seem to be most prominent. There are few disciplines that do not originate, in one way or another, in the works of the Stagirite[1]. It is so because it was Aristotle who showed how it is possible to form knowledge about that which is contingent, thus opening the gates for broadly understood scientific consideration of nature. For his master, Plato, knowledge of the contingent was a contradiction of terms: according to him one can have knowledge of that which is immutable and eternal, i.e., of true substances: ideas and mathematical entities. By contrast, contingent reality can at best be a source of true opinion (*doxa*), the cognitive value of which is limited by particular conditions of experience: a particular statement is true only here and now[2]. For this reason the corporeal world as such cannot be the subject of knowledge, since it is mutable and, therefore, contingent in its being. Consequently, natural science is impossible, and so the analysis of natural phenomena is for Plato, as it was for Socrates[3], a waste of time. Aristotle, who spent twenty years in the Academia, knew well that Plato was no naturalist[4] but he did not

* Editor's note: the notes in this text are presented as footnotes. The author has chosen to diverge from the standard of this periodical, because quoted material comes from unpublished manuscripts.

[1] Mathematics and history are the two to which Aristotle made hardly any contribution.

[2] Plato, Republic, 476 C-477 D.

[3] Plato, Phaedo, 95 E-99 D.

[4] Aristotle, *De generatione et corruptione*, 315a, 30-33.

want to follow his footsteps. On the contrary, he wanted to prove Plato wrong with respect to nature and to show that the physical world can be an object of scientific inquiry, too.

The contingent character of beings of the physical world is manifested in their temporal character[5]. Here we can see two aspects, referring to beings the existence of which has time limits (in contrast to eternal beings) and to processes of change occurring in time (in contrast to instantaneous changes). Even in the superlunary world, eternal and immutable as it is in its substance for Aristotle, we can see something that is changing: indeed, it is the very measure of change, namely the local motion of heavenly bodies[6]. In their revolutions, the heavenly spheres are not limited merely to measuring the processes taking place in the sublunary world – they are governing them through influencing the generation and corruption on all levels of being: from transmutations of elements to physiological changes affecting the emotions of people[7]. Only the intellect, being immaterial, remains independent of those influences. On the contrary, it is itself able to govern emotions, by making them conform to the standards of behavior carefully established by reason as a golden mean between the opposing extremities[8]. As a result, we can speak of three realms of natural phenomena, characterized by specific varieties of change: changes concerning inanimate bodies, changes concerning animate bodies, and changes concerning souls. In all three we encounter all four Aristotelian types of change: substantial, qualitative, quantitative, and local[9], but they are understood in the light of each of these aspects of nature.

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[5] Aristotle, *Physics*, 200b, 10-12.

[6] Aristotle, *De caelo*, 287a, 25-30.

[7] Aristotle, *De generatione et corruptione*, 337a, 1-5. The statement that stars influence proportions of elementary qualities, which affect humoral composition and hence emotions is attributed to Aristotle, even though he does not say it expressly in any of his texts. This inference was made by Ptolemy of Alexandria in his *Tetrabiblos* and became a part of Aristotelian tradition. Cf. E. Grant, *Planets, Stars and Orbs. The Medieval Cosmos 1200-1687*, Cambridge 1994, pp. 571-573.

[8] Aristotle, *Nicomachean Ethics*, 1109a.

[9] Aristotle's theoretical exposition of local motion is presented at length in *Physics*, while the remaining three types of change are rather briefly discussed in *De generatione et corruptione*.

In such a way, a natural philosopher is able to form a complex classification of phenomena allowing him to analyze various contingent facts concerning the world. Out of this multitude, we have decided to select three phenomena: local motion will serve as an example for the study of change in inanimate bodies, temperaments – as an example for the study of change in animate bodies, and virtues – as an example for the study of change in souls[10]. In all three cases, Aristotle is trying to present a scientific analysis of a phenomenon by trying to define a state (Greek *hexis*, Latin *habitus*) that is somehow related to the phenomenon, either as its end or its duration, so that he can get something tangible, or substance-like, to focus on. Although in *Categories* he mentions it as a separate category only briefly [11], he speaks of state mostly with respect to three other accidental categories: passion, relation, and quality[12]. The definition of it, which he gives in book Lambda of *Metaphysics*, refers to state as a kind of process towards a disposition, its part or perfection, thus underlining in what way this category can be applied in analyzing change. A process entails successive parts that can be compared with (or related to) one another[13]. Since his approach was widely imitated in scholastic philosophy (in a way it is still being used even in our times), we shall supplement examples taken from Aristotle with their counterparts taken from medieval authors.

Local motion

For Aristotle local motion was a complex issue. It is first divided into circular, which is proper for the heavens, and rectilinear, which is proper for the sublunary world. The latter is further divided according to two criteria: its character or direction. The former specifies whether motion is natural or violent, the latter encompasses six primary directions (up, down, right, left, forward, backward), of which the first pair is most important, because it characterizes natural motions of

[10] The second and third are treated as states belonging to the category of quality (Aristotle, *Categories*, 8b, 28-30), the first, as states belonging to the category of place.
[11] Aristotle, *Categories*, 2a, 1-2.
[12] Aristotle, *Categories*, 8b, 9a-b.
[13] Aristotle, *Metaphysics*, 1022b, 3-10.

sublunary bodies: gravitation of the heavy ones and levitation of the light ones. Yet another distinction refers to the velocity of motion: it is constant for motions in which a body is traversing the same distance in every unit of time, or it can vary by being slower (deceleration) or faster (acceleration) in subsequent units of time. This set of criteria allows Aristotle to distinguish a number of types of motion, each of which is treated as a species in the category of passion (Greek *paschein*, Latin *passio*), to which motion belongs[14]. Thus he is able to formulate general statements about motion with help of universal concepts concerning them. These concepts possess validity only when one assumes that individual motions necessarily follow the same rules, which are expressed as proportions of constituent qualities characterizing motion: force, resistance, distance and time.

When we try to analyze motion from the point of view of the Aristotelian theory seeing it as a move from privation to habitus, or the other way round, there seem to be two ways of approaching local motion. Either it is a privation of a natural place, the achievement of which gives it rest, or it is rest which is privation of change and then motion is nothing but all the states (*habitus*) of that change[15]. The former approach analyzes that aspect of motion, in which we are interested in completion of action, and therein motion is understood as belonging to the same category as the form that is achieved at its end (place or, in case of other types of change, a quality or a quantity); the latter is an approach in which we are interested in action as such, and then motion belongs to the category of passion. It was Avicenna who first noted that the two approaches are different and Albert the Great, a thinker distinguished for his work in the reception of Greek and Arabic natural philosophy in early 13th century Latin Europe, called the former *forma fluens*, or the formal aspect of motion, and the latter *fluxus formae*, or the material aspect of motion. Avicenna's distinction between the two aspects of motion was taken over and popularized

[14] Aristotle, *Categories*, 6b.
[15] Aristotle, *Physics*, 188b 3-10.

already by Averroeos, even though he himself believed that the proper understanding of motion is the formal one[16].

Averroes's understanding of the problem of local motion is visible in the writings of a Parisian Latin Averroist active at the turn of the 14th century, John of Jandun. In his commentary on *Physics*, John of Jandun is no different from other Aristotelians of his times in treating motion as a phenomenon which can be found in three types of change: local, qualitative and quantitative. His understanding of motion in three categories is convergent with the *communis opinio doctorum*. In all three, motion is an imperfect act[17]. It is an act, because it refers to something that used to be in potency and cannot be a pure potency. Motion is also a form that is different both from agent and patient, even though it is not independent from them[18]. Before any action starts, things are in potency. What comes between potency and a perfect act is motion. Accordingly, motion can be understood in two ways: in one way, as a flowing form (*forma fluens*), it is different from its end only inasmuch as it is somewhat less perfect than it. In the other way, it is understood as continuous flux of a form (*fluxus formae*)[19]. In his questions to *Metaphysics*, Jandun says that, according to Averroes, of the two opinions about motion the former is truer, the latter, more famous. *Fluxus formae* describes motion as belonging to the category of passion, *forma fluens* – as belonging to the category of the subject of motion. In the latter sense, it is not subject to quantity, because it is in many

[16] M. Gensler, *Kłopotliwa zmiana, czyli Waltera Burleya zmagania ze zmiennością rzeczy*, Łódź 2007, pp. 32-33.

[17] Johannes de Janduno, *Subtilissimae quaestiones in octo libros Aristotelis de physico auditu*, Venetiis 1544, V, Q. 3, f. 71 vb: "Caliditas enim fluens quae praecedit terminum calefactionis non differt a caliditate quae terminat motum nisi sicut minus perfectum et magis perfectum".

[18] Ibidem, III, Q 4, f. 40va: "Dicitur communiter quod motus est immediate subiectum actionis et passionis (...), ergo motus est prior naturaliter actione et passione. Si quidem subiectum natura prius est accidente, ergo ipse motus prius producitur ab agente quam actio et passio. (...) Dico quod immo ipse motus bene dependet ab agente per se. (...) Et patet faciliter, quia omni potentiae per se activae correspondet potentia per se passiva et e converso".

[19] Ibidem, V, Q. 3, f. 71 vb – 72 ra: "Nomen motus significat illa duo aequivoce vel analogicae, quorum unum est sicut materia, vel ad modum materiae quoquo modo, scilicet forma quae fluit, et alterum ad modum formae, scilicet fluxus formae". Cf. also M. Gensler, *op. cit*., pp. 162-3, note 289 sq.

categories and is not different from the terminus of motion. In the former sense, it is subject to quantity, because it is composed of parts of the same character (*eiusdem rationis*) conjoined with one another[20].

John of Jandun follows Averroes in his preference for the "truer opinion", when he states that rest is a state of completion, since motion ceases when the habits are present in matter[21]. However, he makes use of the "more famous opinion", too, when he notes that rest, which is a privation, cannot be compared directly to motion. That something does not have a quality means only that it may have that quality. Consequently, in order to explain how a quality may be obtained, he distinguishes two kinds of patients: those which are not disposed or contrarily disposed to the agent (e.g. water to fire), and those which are disposed to the agent (e.g. transparent medium to light); in the first case there is motion, in the other, change is instantaneous[22]. In motion

[20] Johannes de Janduno, *Quaestiones in duodecim libros Metaphysicae*, Venetiis 1553 (repr. Minerva, Frankfurt/Main 1966), V, Q 19, f. 65rb: "Motus accipitur duobus modis: uno modo pro forma imperfecta quae fluit et tendit ad ulteriorem perfectionem; alio modo accipitur pro via ad perfectionem, quae via est fluxus. Et sic sunt duae viae de motu, prima est verior, secunda est famosior, ut dicit Commentator, tertio Physicorum. (...) Capiendo motum primo modo, sic motus universaliter non est quantitas. Et ratio est, illud quod est in diversis praedicamentis non est simpliciter quantitas, quia tria praedicamenta non sunt unum praedicamentum simpliciter. (...) Sed motus pro forma fluente est huiusmodi, quia capiendo motum pro forma fluente non differt a termino motus nis secundum magis et minus perfectum. (...) Secundo dicendum quod capiendo motum secundo modo, sic est quantitas, et ratio est, omnis forma quae est divisibilis in partes eiusdem rationis per se copulatas ad communem terminum est continua quantitas".

[21] Johannes de Janduno, *Subtilissimae quaestiones...*, VI, Q. 7, f. 82 vb: "Habitibus praesentibus in materia cessat motus". This is a famous quotation from Aristotle's *De generatione et corruptione*, 324b, 14-17, which became a stock phrase mentioned in florilegia (collections of useful quotations), popular sources of easy erudition, e.g. *Auctoritates Aristotelis*. Cf. J. Hamesse (ed.), *Les Auctoritates Aristotelis. Un florilège medieval. Etude historique et édition critique*, Louvain-Paris 1974.

[22] Ibidem, III, Q. 4, f. 40rb - vb: "Quia sicut quiescens significat per modum activi, sic et movens et e converso, sed dissimile est in hoc quod ipsa quies, cum sit quaedam privatio, non comparatur proprie ad aliquid ut ad efficiens, sed solum ut ad subiectum. (...) Ad aliud potest dici quod actio non est in agente formaliter et subiective, id est tamquam in subiecto suo, cui inhaeret, sed solum effective vel finaliter, id est tamquam in efficiente vel tamquam in suo fine propter illa quae primaria intentione agunt propter se. (...) Relatio nova fit in aliquo subiecto per motum et transmutationem, ut si quis transmutatur ad albedinem quam prius non habebat,

understood in general, a part is obtained after a part[23]. In local motion, it means that a body occupies a number of positions (*ubi*), which are of the same genus essentially (each belongs to the category of place), even though they are specifically different (each is distinguished by its own positioning in relation to others)[24]. This makes it possible to compare them with one another.

The opinion that local motion can be analyzed in a quantitative way when approached as belonging to the category of passion was taken over and elaborated by later scholastics. It achieved its most developed form in the writings of English authors belonging to the so-called Oxford School of Calculators in the first half of the 14th century. Richard Kilvington, one of the founders of the school, analyzed motion

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certum est quod ab illo agente sit similis alteri albo, et per motum illum aliquo modo, quia numquam fieret esse similis sine motu. (...) De numero eorum quae sunt ab agentibus per se duo sunt genera. Quaedam enim sunt ad quae subiectum passivum non est summe dispositum, immo habet contrariam dispositionem ad illa, ut igne appropinquanto aquae, ipsa aqua non est summe disposita ad caliditatem perfectam, immo habet contrariam dispositionem. Et talia forte sunt ab agentibus mediantibus motibus et transmutationibus subiectorum et ita, scilicet agente approximato passo, non statim recipiuntur ab agente non passo, sed oportet esse tempus medium et motus in tempore. Quaedam vero sunt ad quae ipsa subiecta sive passiva statim sunt disposita sufficienter et non habent dispositionem contrariam ad ea, sicut diaphanum ad receptionem luminis, et talia bene fiunt ab agente per se non mediante motu medio".

[23] Ibidem, III, Q. 2, f. 38vb-39ra: "Motus non est quicumque actus imperfectus, sed actus imperfectus existens in subiecto tendente continue et fluente ad ulterius complementum quantum ad motum intensionis vel ad ulteriorem diminutionem quantum ad motum remissionis. Ista autem tendentia continua ad ulteriorem perfectionem non est de essentia motus, qui est actus imperfectus, sed est aliquid necessario requisitum ad motum. (...) Hoc nomen motus famosius accipitur pro fluxu sive tendentiam quam pro ipsa forma imperfecta, cuius pars generatur post parte".

[24] Ibidem, III, Q. 6, f. 41va-b: "Via ad terminum non est eiusdem essentiae cum illo termino, (...) sed motus qui est fluxus formae est via ad ipsum terminum ad quem, ut manifestum est, quia mediante huius fluxu mobile pervenit usque ad terminum ad quem. (...) Iste fluxus formae qui est motus secundum opinionem famosiorem est de genere passionis. (...) Sed terminus motus est de genere substantiae, vel quantitatis, vel qualitatis, vel ubi. (...) Aliqui autem dicunt quod fluxus ipse, ut est quid continuum, est de genere quantitatis. (...) Sed dubium est de motu locali, quo modo fit idem cum termino ad quem. (...) Forte dicendum quod talis motus, si esset, non esset idem secundum speciem cum termino ad quem, sed esset idem essentialiter secundum genus. Nam in eodem genere sunt ubi sursum et ubi deorsum".

in terms of potency. He was interested both in the active potency, i.e., the power needed for a motion to begin, and the passive potency, i.e., the resistance offered by the medium in motion of an object. In the first case, he tried to establish the values of the states known as *maximum quod sic* (the greatest resistance that can be overcome by the power needed to end the stasis of the body) and *minimum quod non* (the lowest value of resistance that is sufficient to prevent motion). Kilvington, who inherited the problem from Averroes and John of Jandun, was able to prove, by means of calculus of compounding ratios, that it is impossible to give the value of active potency by means of the *maximum quod sic*, yet it is possible to do so by means of the *minimum quod non*. With respect to the passive potency, he showed, again with the help of the calculus, that resistance of a body can be overcome even by an infinitely small agent when it acts over an infinitely long time[25]. This way he elegantly proved the truth of the old proverb saying that *gutta cavat lapidem non vi sed saepe cadendo.*

Once the understanding of motion as belonging to the category of passion was well established, the quantitative comparison of various specific forms it obtained was made possible. William Heytesbury, who belonged to the second generation of Calculators, compared fast and slow motions using the distinction of habit and privation. He presents velocity as motion from privation of speed (*tarditas*) to speed in perfection (*velocitas*), in which we can measure the magnitude of various forms of velocity against one another. Since they belong to the same genus, slowness and velocity are just names for one and the same phenomenon, the specific forms (i.e. habits) of which can be compared[26].

[25] E. Jung-Palczewska, *Między filozofią przyrody a nowożytnym przyrodoznawstwem. Ryszard Kilvington i fizyka matematyczna w średniowieczu*, Łódź 2002, pp. 71-75. Cf. also Eadem, *Richard Kilvington on local motion*, in: P.J.J.M. Bakker (ed.) *Essays in Honor of Zenon Kaluza*, Brepols, Paris 2002, pp. 3-18.

[26] Guillelmus Heytesbury, *Regulae solvendi sophismata*, Venetiis 1494, f. 38va: "Tarditas enim est quasi privatio velocitatis non obstante quod de virtute sermonis omnis tarditas est velocitas et econverso, sicut quaelibet parvitas est magnitudo, et universaliter ab habitu et perfectione sua denominanda est res quaecunque habens illam". I would like to thank Robert Podkoński for drawing my attention to this passage.

Temperaments

Aristotle's theory of four temperaments derives from his fundamental physical concept of four elements (fire, air, water, and earth), which can transmute into one another. All sublunary bodies are made up of a mixture of them. The proportions of elements decide which of the primary qualities (hotness, coldness, dryness and humidity) that characterize them dominate in the composite thus affecting the qualities of the body[27]. Since these qualities are derived from the primary ones, they reflect their quadripartite character in a more or less direct way. Of all living creatures humans possess the best harmonized mixture of elements, which makes it possible for their bodies to be informed by the most noble kind of soul, the intellectual one. Nevertheless, even in humans one can observe individual variations of temperaments resulting from a relative domination of one of the four bodily fluids (humors), which are responsible for various physiological processes sustaining the body[28]. Even though the proportion of humors constantly changes in every individual depending on the diet, climate, season, constellation and other factors, everyone has his or her natural disposition (*habitus*) for a particular temperament. This particular temperament is a consequence of a unique composition of form (provided by the father), matter (provided by the mother) and the generative influence of the sun (for later authors also the planets) in the moment of conception (or birth)[29]. By presenting a temperament as a relation of a set of constituent qualities Aristotle is able to treat it as a proportion an discuss it much in the same way as he does with respect to other types of motions.

In his *Physics* questions, John of Jandun elaborates on Aristotle's opinion concerning variations in temperaments in terms of relations. According to him, an alteration towards a corporeal habitus, like health or illness, is not a proper alteration, because it is with respect to something external, i.e., the elementary qualities of hotness and coldness, dryness and humidity, and thus is more like a relation, since there is a motion from one contrariety to another. For instance, health

[27] Aristotle, *De coelo*, 270a, 29-33.
[28] Aristotle, *Problemata*, XXX, 953b – 954a.
[29] Aristotle, *De generatione et corruptione*, 336a-b; *Physics*, 194b, 13-14.

is a quality which is a resultant of the degree of elementary qualities in the humors, and since it is funded as a disposition in their proportion, the change towards health is in fact a change of a relation between the humors. And such an alteration is not an essential alteration but an accidental one, because it results from alterations in hotness, coldness, etc. There is, however, a proper alteration concerning temperaments, namely changes in humors themselves; it refers to actual heating and cooling which take place in blood, phlegm, bile and black bile as a result of digestion of various types of food and drink. For this reason, people of various complexions, viz. choleric, sanguine, melancholic or phlegmatic, react differently to the changes in food and drink. For instance, cholerics cannot drink too much, because the hotness of the drink increases their natural heat, already high in people of that temperament, too much, which may cause a disease. Conversely, their passions are moderated when their bodies are cooled thanks to an appropriate diet[30].

[30] Johannes de Janduno, *Subtilissimae quaestiones...*, VII, Q. 7, f. 93rb - vb: "Qualitates de prima specie qualitatis sunt habitus et dispositiones. Habitus autem quidam sunt corporis, ut sanitas et aegritudo. (...) Et quidam sunt habitus animae, et isti sunt duplices, quia quidam sunt in parte animae intellectivae, (…) scilicet intellectus, scientia, prudentia, et ars. Alii sunt habitus in parte opposita, sive in appetitu , et isti dicuntur morales et sunt omnes virtutes morales. (...) Dicitur communiter quod istae qualitates possunt considerari dupliciter: uno modo quantum ad suas essentias, et sic sunt in genere qualitatis relationis; alio modo posssunt considerari quantum ad aliquas proprietates consequentes eas, et sic sunt ad aliquid, sicut ipsam sanitatem consequitur quidam respectus ad bene operandum opera naturalia. (…) Isti habitus corporis, quamvis secundum essentias suas sint entia absoluta et non ad aliquid, tamen consequuntur immediate quasdam relations et fundant in ipsis relationibus, sicut in dispositionibus et praeparationibus sine quibus non possunt esse. Verbi gratia, sanitas consequitur immediate commensurationem seu proportionem debitam calidorum, frigidorum, humidorum, et siccorum ad invicem. (…) Et est attendendum quod licet alteratio proprie dicta non sit per se ad istas qualitates, scilicet ad habitus corporis, est tamen ad eas alteratio quoddam modo per accidens. Nam acceptio vel remotio sanitatis consequitur alterationem proprie dictam, verbi gratia calefactionem vel frigefactionem, et alias huiusmodi, ut manifestum est per experimentum et sciunt medici. (…) Moderatio passionum potest bene consequi aliquam alterationem corporis proprie dictam. Cum enim aliquis moderate calidus est, (…) tunc ipse magis moderate irascitur. Et si quis est multum excellenter supercalefactus a corde aut a sanguine, difficile aut impossibile est ipsum moderare iram. Unde homines cholerici sunt magis irascibiles et iracundi caeteris. Unde si in homine cholerico debet refrenari et

Walter Burley, an English philosopher little younger than Jandun[31], made extensive use of the Aristotelian pair: habit / privation in his commentary on Aristotle's *On senses and sensible things* belonging to the collection of small treaties about nature, known as *Parva naturalia*. For Burley, the properties of living beings can be the subject of scientific inquiry if we analyze them as belonging to the category of state. This refers not only to fundamental characteristics, such as life and death, but also qualities, passions and states, such as health and illness, anger and desire, or awakenness and sleep. Arranging those properties in contrastive pairs helps to present a systematic description of them. Consequently, Burley is able to identify certain natural phenomena as specific states of a particular disposition or temperament[32]. This way, in the commentary on *De somno*, belonging to the same collection, he can explain that, e.g., epilepsy is a state which seldom affects people of melancholic character, because for him epilepsy is a pathological form of sleep, while melancholy induces

moderari ira, necesse est eius corpus fieri minus calidum aliqualiter. Propter hoc bonum est cholericis abstinere a cibariis acute caliditatis ex quibus generatur sanguis multum calidus et spiritus".

[31] Burley came to Paris in 1308, two years before Jandun left it. Cf. M. Gensler, *Walter Burley on the Influence of the Planets*, in: M.C. Pacheco, J.F. Merinhos (eds.), *Mediaevalia. Textos e Estudos* 23 (2004). *Intellect and Imagination in Medieval Philosophy*, Porto 2004, p. 83.

[32] Gualterus Burley, *Commentarius in librum De sensu et sensato*, Ms London, Lambeth Palace, f. 175 rb-va: "Sensus, memoria, ira, desiderium, somnus et vigilia, iuventus, senectus, inspiratio, expiratio, mors et vita sunt passiones totius coniuncti. (...) quaedam insunt omni animali et quaedam insunt omni viventi, et quaedam alicui et non omni. Sensus, memoria, ira, desiderium, et omnino appetitus, super gaudium et tristitia - ista inveniuntur in omnibus animalibus, ut dicit Philosophus, et dicit 'fere', quia memoria non inest nisi animalibus perfectis. Unde libro *De animalibus* dicit quod memoria non inest carentibus cerebro, nec ira inest carentibus felle, adhuc sunt quattuor coniugationes passionum quarum quaedam insunt omni animali et soli quaedam insunt soli et non omni, et quaedam insunt omni et non soli. Somnus et vigilia insunt omni animali et soli animali. Expiratio et inspiratio insunt soli animali et non omni, nam inspiratio et expiratio non inveniuntur nisi in habentibus pulmonem. Iuventus et senectus insunt omni animali et non soli animali, quia omnibus animatis. Similiter mors et vita, quorum unum est ut privatio et aliud ut habitus, insunt omni animali et non soli, quia insunt omni animato".

sleeplessness[33]. Sleep is thus a habit, which is formed as a result of a relation of the temperament to the external conditions, most of all the diet. A naturalist or a physician, who knows the temperament of the patient can adjust the diet to eliminate the problems caused by too much or too little sleep.

Virtues

Even though it belongs to ethics, which is a part of practical philosophy, Aristotelian doctrine of virtues is linked to natural philosophy through the theory of the soul. A virtue is seen as a "golden mean" between opposing natural inclinations of the sensual part of the

[33] Gualterus Burley, *Commentarius in libros De somno*, I.7, Ms London, Lambeth Palace, f. 166 va – 167 ra: "Quod autem evaporatio ascendens ad caput sit causa somni probatur per septem. Signum primum est illa: quae sunt multum evaporantia inducunt multum somnum, ut vinum, lolium, mandragora; et hoc est signum quod evaporatio est causa somni. Mandragora est arbor cuius cortex, si teratur et misceatur cum vino vel cum aliquo liquore potabili et detur alicui ad bibendum, ipse redditur insensibilis et propter hoc talis potus datur eis ad bibendum, quorum corda debent secari vel uri. Tales enim fiunt per potum illum quasi insensibiles, nec sentiunt dolorem propter fortitudinem somni. (…) Tertium signum est quod quaedam aegritudines quae fiunt ex materia calida et humida inducunt multum somnum propter multam evaporationem provenientem ex humida superfluitate et calida, cuius sunt febris et letargia, et hoc est signum quod evaporatio est causa somni: letargia est passio cerebri inducens oblivionem, quam patiuntur illi qui nihil possunt memoriter retinere. 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. (…). Et propter hoc est, quia est tanta abundantia humiditatis et tot vapores ascendunt in pueris, ideo epilentia accidit saepius constitutis in puerili aetate quam quando sunt in alia aetate, et hoc est signum quod in pueris est multa evaporatio. Epilentia est aegritudo causata ex magna superfluitate ascendete ad superiora qua ingrossata descendit inferius per vias respirationis et obturrat venas exspirationis et deficiente exspiratione moritur animal. Causa quorum primum fiunt epilentici est quia epilentia videtur esse quidam somnus. Est enim impotentia sentiendi causata ex evaporatione. (…) Septimum signum est quod melancholici non sunt somnolenti. Et hoc est, quia sunt frigidi et sicci, et sunt multum edates. Ex hiis potest colligi quod evaporatio ascendens ex nutrimento ad cerebrum et rectum descendens, efficit impotentiam sensus qui est somnus. 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".

soul[34]. The golden mean is discovered by reason and later established as a disposition of the soul through habituation. As a habit, virtue belongs to the category of relation[35]. Consequently, it can be analyzed using the same methodological approach as in the analysis of motion or temperaments. We are not surprised, then, that in establishing what is a virtue, Aristotle presents it as a kind of proportion of the middle to the opposite extremities[36]. This enables him to tackle such issues as growth and weakening of virtue: they are processes, in which successive parts can be compared with one another.

Medieval Latin philosophers, who studied the ethical theory of Aristotle, had no reservations about his presentation of it. Following the scholastic fashion, they tried only to present it in a still more consistent way. This is why in his discussions concerning virtue, contained in questions 49 to 67 of *Summa theologiae* I.II, Thomas Aquinas analyses first the nature of *habitus*, pointing that although Aristotle associated it with several categories, it should be properly seen as belonging to the category of quality[37]. He explains that it is such a kind of quality, which always presented in relation to something[38], in most cases some action or passion[39]. Most habits are formed by actions gradually, either in the proper sense or accidentally[40]. Virtue, which is a perfection of rational powers of a man, is formed as a disposition, because they are not naturally inclined in one direction[41]. Its subject, in case of moral virtues, is in the irascible and appetitive powers of the sensual soul[42]. This description of virtue allows Aquinas to discuss an array of issues concerning it, from the number of virtues and their types to the relations between them and other passions in man.

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[34] Aristotle, *Nicomachean Ethics*, 1127a, 1103b.
[35] Aristotle, *Topics*, 124b.
[36] Aristotle, *Nicomachean Ethics*, 1133b; *Politics*, 1295a.
[37] Thomas Aquinas, *Summa theologiae*, I.II, q. 49, art. 1, Responsio.
[38] Ibidem, q. 49, art. 2, Ad rationes.
[39] Ibidem, q. 49, art. 3, Responsio.
[40] Ibidem, q. 52, art. 1. He refers here to a comment Aristotle makes with reference to health and illness as related to changes in proportions of natural heat and coldness in his *Physics*, book 7, 246b, 3; 248a, 6.
[41] Ibidem, q. 55, art. 1, Responsio, and 3, Responsio.
[42] Ibidem, q. 56, art. 4, Responsio.

John of Jandun is not entirely satisfied with Aquinas's interpretation of virtue as a habit belonging to the category of quality. However, it is not because he denies it is a quality, but because he believes that as a quality it is an indivisible perfection, and so it cannot possess successive parts[43]. Accordingly, for him alteration of a moral habitus is not a proper one, because if a virtue is a perfection, it is unable to receive degrees: someone achieves a virtue only when he (or she) has attained the highest degree of a moral disposition, just like the heat of fire has only the maximal heat. This is because a proper perfection is indivisible as such. For a moral virtue to form in the sensitive appetite it is necessary either to remove (for Stoics) or diminish (for Aristotle) sensual passions, i.e., motions in the sensitive appetite caused by fantasy. This is why such an alteration in moral habitus is only an accidental one[44]. Still this does not make it impossible for the philosopher to study virtue and its growth or weakening.

[43] Jandun's objection refers to the same passage in Aristotle's *Physics*, book 7, which is cited by Aquinas in question 52, art. 1; cf. note 40 above.

[44] Johannes de Janduno, *Subtilissimae quaestiones...*, VII, Q. 7, f. 93va - 94va: "Ad habitus qui sunt in parte appetitiva, scilicet ad virtutes morales, non est alteratio proprie dicta per se primo, quia nihil alteratur dum accipit propriam virtutem, et sic secundum virtutem propriam non est alteratio. Maior probatur, quia motus non est ad illud vel secundum illud quod est indivisibile, et dico motus proprie dictus qui est continuus. Sed omnis propria perfectio inquantum huiusmodi est indivisibilis, sicut caliditas in summo secundum est propria perfectio ignis. (...) Aliquid esse maxime perfectum potest intelligi dupliciter: uno modo secundum actum, alio modo secundum potentiam propinquissimam. (...) Cum enim aliquis habet virtutem propriam, est in potentia propinquissima ad actum qui est eius maxima perfectio. (...) Quod licet ad ipsas virtutes morales non sit per se alteratio proprie dicta, tamen ad eas est alteratio quoddam modo per accidens. Nam ad acceptionem virtutis moralis in appetitu sensitivo requiritur aut totalis remotio passionum, secundum stoicos, aut saltem moderatio seu modificatio earum, secundum Aristotelem. (...) Qualiter autem virtus moralis generetur in appetitu sensitivo, utrum tota simul aut per pars post partem, bona inquisitio est. (...) Hic videtur consequi quod non acquiritur continue pars virtutis post partem, quia sic esset vera propria alteratio, nisi quod aliqui dicunt quod ad hoc requiritur aliud, scilicet quod qualitas sit sensibilis quae acquiritur et subiectum sit per eam sensibile. Sed puto quod ad alterationem proprie dictam bene sufficeret continua acquisitio unius partis post aliam partem illius qualitatis ad quam est alteratio, ibi enim esset verus motus".

Conclusion

Although Aristotle was opposing Plato when he declared that natural science is possible, he was concordant with him in the opinion that in order to deserve its name knowledge of nature must be immutable and necessary, even though its subjects are temporary and contingent. When we look at the variety of contingent phenomena which are the subject of a scientific analysis for Aristotle and his scholastic followers, and the way they are analyzed, we can see that Aristotle applies two research tools which help him isolate the immutable elements of phenomena. The first and more general one is the concept of category, the application of which makes it possible for him to introduce an elaborate taxonomy of kinds of being in the form of a hierarchy, which starts with species and ends in the concept of being as such. This tool, however, is useful only for the analysis of that which is, but not that which changes, which is a property characterizing many, if not most, natural beings. Here Aristotle applies the other tool, which has a profoundly Platonic character: proportion. No one would dare to question the scientific character of geometry, the study of proportions. Consequently, if in the analysis of a natural issue one is able to show that there are proportions, which is the endeavor taken by Aristotle and his scholastic followers, then the knowledge of those proportions is as scientific as the study of proportions in triangles. That which is an equivalent of triangles in the study of natural processes is habitus or state. No matter whether we apply this tool to local motion of inanimate bodies, or changes in body humors, or growth or weakening of a virtue, everywhere we are following the same procedure. We identify the process by means of establishing its termini, or extremes, and then we compare particular states in relation to them. This allows us to establish a set of proportions which invariably characterize particular stages of processes. This way a contingent habit becomes eternalized in its relations and a true knowledge of them can be achieved. Thus science of the contingent is formed.

ABSTRACT

HABITUS OR THE POSSIBILITY OF SCIENCE OF THE CONTINGENT

Most of sciences can be traced back to Aristotle. This is because in opposition to Plato he was able to find a way in which one could give a scientific form to reflection concerning contingent facts of every-day life. Knowledge of the contingent was made possible thanks to the Aristotelian concepts of category and state (habitus). It is the latter concept that was especially important for forming knowledge about change. Aristotle and his medieval followers apply it in analyses of various processes, from local motion to changes in temperaments, to formation of virtues.

KEYWORDS: Aristotelianism, history of science, change
SŁOWA KLUCZOWE: Arystotelizm, historia nauki, zmiana