Studia graeco-arabica

9

2019

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Subscription orders
Information on subscription rates for the print edition of Volume 9 (2019), claims and customer service: redazione@pacinieditore.it

Web site: http://learningroads.cfs.unipi.it/sga
Service Provider: Università di Pisa, ICT - Servizi di Rete Ateneo

ISSN 2281-2687
ISSN 2239-012X (Online)
Registration at the law court of Pisa, 18/12, November 23, 2012.
Editor in chief Cristina D'Ancona (cristina.dancona@unipi.it)
Mailing address: Dipartimento di Civiltà e Forme del Sapere, via Pasquale Paoli 15, 56126 Pisa, Italia.

Italian Scientific Journals Ranking: A (ANVUR, Classe A)
Indexing and Abstracting: ERIH PLUS (SCH ESF); Index Islamicus (Brill Bibliographies); Scopus (Elsevier)

Cover
Mašhad, Kitābḫāna-i Āsitān-i Quds-i Raḍawī 300, f. 1v
Paris, Bibliothèque nationale de France, *grec* 1853, f. 186v

A. Lammer, *The Elements of Avicenna's Physics. Greek Sources and Arabic Innovations*, W. de Gruyter, Berlin - Boston 2018 (Scientia graeco-arabica, 20), XVII + 594 pp.

This book, issued from the author's doctoral dissertation, deals primarily with the so-called *Physics* of the *K. al-Šifāʾ*, i.e. II, 1, *al-Samāʿ al-ṭabīʿī* (henceforth, Avicenna's *Physics*). Written by Avicenna, as Lammer indicates in his introduction (p. 1), "around the year 412/1022)", this part of the *K. al-Šifāʾ* is "neither a commentary on Aristotle's *Physics* nor is it an interpretation of that work. It is more adequately described as Avicenna's own version of that science whose subjects have traditionally been transmitted and discussed under the title of Aristotle's Greek work, in Arabic *Samʿ al-kiyān* or *al-Samāʿ al-ṭabīʿī* (...) According to Avicenna's understanding, the subjects discussed in Aristotle's work belong to, and make up, the science of 'physics', which he conceives as the most common science or discipline within the area of natural philosophy" (p. 2). In claiming that this part of the *K. al-Šifāʾ* provides us with insights into Avicenna's own appropriation of Aristotelian physics, rather than into his understanding of Aristotle's *Physics*, Lammer follows the lead of Dimitri Gutas, who laid emphasis in his 1988 book and in many subsequent publications on Avicenna's stance as a philosopher in his own right – a philosopher who, albeit belonging to the Aristotelian tradition, did not set for himself the task of explaining Aristotle, rather that of providing a systematic account of the whole of the philosophical sciences.[1]

Against this background, the main idea aired in Lammer's volume is to vindicate for Avicenna's own physics the same degree of originality that contemporary scholarship grants to his logic and metaphysics. To this end, Chapter 1, "The Arabic Fate of Aristotle's *Physics*" (pp. 9-41) surveys the questions surrounding the translation and circulation in the Arabic-speaking world of Aristotle's *Physics* and its commentaries. First Lammer deals with the relevant entry in Ibn al-Nadīm's *Kitāb al-Fihrist*, enumerating various difficulties and ambiguities that, as in other cases, are present in it (pp. 10-17) and coming to the conclusion that more than one integral translation of the *Physics* into Arabic, plus Alexander and Philoponus' commentary, seem to have been available. He also aptly observes, however, that "All this remains speculation, because none of these translations has survived

[1] D. Gutas, *Avicenna and the Aristotelian Tradition, Introduction to Reading Avicenna's Philosophical Works*, Brill, Leiden - New York - København - Köln 1988 = D. Gutas, *Avicenna and the Aristotelian Tradition, Introduction to Reading Avicenna's Philosophical Works. Second, Revised and Enlarged Edition, Including an Inventory of Avicenna's Authentic Works*, Brill, Leiden - Boston 2014 (Islamic Philosophy, Theology and Science. Texts and Studies, 89), pp. 325-6 and 334 (of the 2014 edition): "This perception of Aristotle by Avicenna, along with the concomitant belief in human progress in the acquisition of this knowledge (...) enables Avicenna on the one hand to have a reverential but critical attitude toward Aristotle, and on the other to claim for his own discoveries a new stage in the serial acquisition of knowledge. (...) In his earlier writings Avicenna shows a respect for the transmitted tradition and, more importantly, a respect for and adherence to the manner and method of philosophical discussion. (...) In his later works the tradition becomes internalized and integrated rather than reproduced, and it is synthetized into the systematic scholastic philosophy of Avicenna which was forever to replace Aristotelianism in Islam. (...) As Avicenna's awareness of his personal contribution to the history of philosophy grew and he developed a progressively more precise conception of the praxis of philosophy, and he increasingly stopped seeing himself in the traditional mold of philosopher, i.e., a mere commentator on the Aristotelian texts (...), he started coming into his own and speaking in his own voice as a philosopher (...). Once he had integrated in his mind the Aristotelian tradition with all the conflicting views, his purpose, which was never fully historical, became completely systematic", a vision echoed by Lammer: "Indeed, in his own systematic works, Avicenna is no commentator on Aristotle and in many ways even exceeds Aristotle by providing novel ways of how Aristotelian materials can be interpreted and integrated, rearranged and refined in innovative ways, often in light of later developments. The result of this appropriation, viz., Avicenna's own philosophy, as expressed in his various works, must not be taken as a way to comment on Aristotle but as a way to transform and develop Aristotle" (pp. 2-3, whitout however reference to Gutas).

in any substantial form" (p. 17), except for one: the important manuscript housed in Leiden, Bibliotheek der Rijksuniversiteit, *or*. 583. As detected by Sh. Pines and G. Endress,[2] this manuscript contains, together with the unique copy of the Arabic translation of the *Physics* that has come down to us in its entirety,[3] also a great amount of glosses drawing from Greek and Arabic commentaries. The translation was the work of Isḥāq ibn Ḥunayn, and the compilation now in the Leiden library, as recalled by Lammer, attests for the circulation of the late-antique exegeses that moulded the reception of the *Physics* in the so-called "Aristotelian circle of Baghdad". The pivotal importance of Philoponus' commentary in this circle provides the basis for Lammer's remark that "Avicenna reacts critically to Philoponus and his way of reading and interpreting Aristotle's *Physics*. Thus, it is at least indirectly that Avicenna also reacts critically to his colleagues from Baġdād, because he criticises the very way in which they read Aristotle's *Physics*, viz. through Philoponus" (p. 19).

A survey of the post-Aristotelian authors follows, in chronological order from Theophrastus to Simplicius. In this survey are included all "those thinkers who, in one way or another, wrote on *Physics*, commented on Aristotle, were translated into Arabic, were influential in their Arabic translation, or may otherwise have had an impact on the formation of Avicenna's thought on natural philosophy" (p. 19). Such a large spectrum accounts for the fact that also works that remained unknown to the Arab readership are mentioned by Lammer, like Plotinus' treatise *On Eternity and Time* (p. 25). Among the works that, instead, were known, the commentary by Philoponus "emerges as the second most important source for physics right after Aristotle" (p. 32).

Among the Arabic works that contributed to shape the way in which Avicenna understood the Aristotelian physics, Lammer mentions al-Fārābī's treatise *Maqāla fī l-ḫalā'*, where it is argued against the existence of void and "whose influence on Avicenna is unmistakable" (pp. 36-7). The first chapter ends with the question of his access to the works listed. Even though none of the translations of the Greek works mentioned above is extant except that of the *Physics* itself,[4] Lammer is confident that

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[2] S. Pines, "Un précurseur Bagdadien de la théorie de l'impetus", *Isis* 44 (1953), pp. 247-51, reprint: *The Collected Works of Shlomo Pines*, II, *Studies in Arabic Versions of Greek Texts and in Medieval Science*, The Magnes Press - Brill, Jerusalem - Leiden 1986, pp. 418-22, p. 248 [= 419], mentioned this MS (under the old shelfmark "Warn[er] 583"), remarking that in it "est consignée une version arabe de la *Physique* d'Aristote, accompagnée de gloses de divers auteurs appartenant à l'école philosophique du X^{e} et XI^{e} siècles, dont la plupart des maîtres étaient des chrétiens. L'un de ces auteurs est le philosophe jacobite Yaḥyā b. ʿAdī (m. en 973 ou 974)". It was G. Endress who identified in Philoponus' commentary on the *Physics* the source of many of these glosses: cf. his *The Works of Yaḥyā ibn ʿAdī. An Analytical Inventory*, Reichert, Wiesbaden 1977, pp. 35-38: "The text of the *Physics*, in the Arabic translation of Isḥāq ibn Ḥunayn, was collated by Abū l-Ḥusayn al-Baṣrī with the autograph copy of Yaḥyā ibn ʿAdī, who 'said that he had transcribed it from the autograph (*dastūr*) of Isḥāq, checking it with the original three times, and another time with the Syriac text' (ed. Badawī, p. 76.13), Joint with the *lemmata* of the text is a complete lecture course of the *Physics* compiled by Abū l-Ḥusayn al-Baṣrī, containing the comments of four eminent Aristotelian scholars of the 10th-11th century: Abū ʿAlī ibn al-Samḥ (d. 418/1027), under whom al-Baṣrī has studied the text (*v*. ed. Badawī, p. 77.3), on *Phys*. I-VI 5; Yaḥyā ibn ʿAdī (...), Abū Bishr Mattā (d. 328/940), on *Phys*. II 3-III 4; and, finally, Abū l-Faraj ʿAbdallāh ibn al-Ṭayyib (d. 435/1043), who is the main authority cited on Books VI 5-VIII. The numerous and extensive comments by 'Yaḥyā' (mainly on Books III-VII), which at first sight might be supposed to be the work of Abū ʿAlī's teacher, Yaḥyā ibn ʿAdī, turn out upon closer investigation to be taken from the *Commentaria in Physicam* (written AD 517) of Johannes Philoponus, whom the Arabs called Yaḥyā al-Naḥwī".

[3] *Arisṭūṭālīs, al-Ṭabīʿa, tarǧamat Isḥāq ibn Ḥunayn maʿa šurūḥ Ibn al-Samḥ wa-Ibn ʿAdī wa-Mattā ibn Yūnus wa-Abī l-Faraǧ ibn al-Ṭayyib*, I-II, ḥaqqaqahu wa-qaddama lahu ʿA. Badawī, al-Dār al-qawmiyya li-l-ṭibāʿa wa-l-našr, Cairo 1965-1966. It is a pity that throughout the entire volume the Arabic rendition of the passages of Aristotle's *Physics*, that regularly accompany the Greek original, are cited without reference to the page and line of Badawī's edition. It is obviously possible to find the Arabic passage on the basis of the Bekker page-and-line.

[4] See the preceding note.

indication about "which texts Avicenna used and knew in general, or which translation of Aristotle's *Physics* he was acquainted with" (p. 37) can be extracted from the information available, and this he does in a paragraph entitled "What Did Avicenna Know and What Did He Use?" (pp. 37-41). Here Lammer sides with P. Lettinck, who on terminological grounds thinks that Avicenna made use of a translation of the *Physics* different from that of Isḥāq ibn Ḥunayn (p. 39), while mitigating this conclusion with the just remark that Avicenna was in all likelihood rephrasing in his own language the passages he was referring to (pp. 40-41).

Chapter 2, "The Methodology of Teaching and Learning" (pp. 43-109), consists in an analysis of the first chapter of Avicenna's *Physics*. Avicenna elaborates on *Phys*. I 1, and solves the well-known tension between the method for reaching science in the *Physics* and in the *Posterior Analytics* in a way that "differs from those which the late ancient commentators attributed to Aristotle's *Physics*" (p. 45). The tension consists in that whereas in the *Posterior Analytics* Aristotle proceeds from prior and more familiar to us towards the most universal, in the *Physics* he invites to proceed the other way round, i.e. from the universals to the particulars. The late-antique commentators solved the difficulty by distinguishing the true universals from the indiscriminate universals, i.e. the vague concepts that ought to be determined in the course of the scientific inquiry. Instead, Avicenna considers that proceeding from universals to the particulars is a mode of instruction, not a mode of scientific inquiry: "In light of all this evidence, it emerges that Avicenna took τῶν καθόλου, i.e., whatever word or phrase he might have read in the Arabic translations of the *Physics*, more in terms of the usual meaning as 'universals' which are better known to our intellect and most commonly applicable to natural things. Conversely, the individuals are better known to sensation (...). Thus for Avicenna, too, the *Physics* is a work about what is common to all natural things and, therefore, should naturally precede all other works on natural philosophy, as these have more particular concerns. (...) Avicenna neither uses nor mentions methodic experience or any other method of scientific inquiry in his *al-Samāʿ al-ṭabīʿī*. In fact, once we have realised that Avicenna takes Aristotle's dictum literally, it becomes clear why Avicenna does not need to mention such methods of inquiry, because in his *al-Samāʿ al-ṭabīʿī* he is not engaged in research and inquiry at all, instead being concerned with another form of knowledge acquisition: that which is achieved through teaching and learning. Consequently, Avicenna does not present a method of inquiry – not even one that follows the way of procedure – as Aristotle and his Greek commentators, especially Philoponus, had done. Instead, Avicenna adopts a mode of instruction. It is instruction and teaching which proceeds from the common and generic universals to the particulars, because what is common is better known to our intellects" (pp. 69-70). This allows Lammer to conclude that physics for Avicenna is a science that, exactly as metaphysics, proceeds in apodictic manner. Being included in a hierarchical structure of sciences that depends upon the universality of their subject-matter and principles, physics is for Avicenna "neither the first kind nor is it a universal science", rather "is a particular science dependent upon metaphysics for its ultimate foundation and validity. The science of physics may be the most common science within natural philosophy, but it is not universal. This is the reason for why, at the outset of physics, we have to be informed about the principles of that science 'by way of postulation and positing' (*ʿalā sabīl al-muṣādara wa-l-waḍʿ*). This, in turn, entails that those chapters of Avicenna's *al-Samāʿ al-ṭabīʿī* which provide an account of the principles of natural things, i.e., most of the entire first book, strictly speaking have nothing to do with natural philosophy (...). In other words, Avicenna conceives of the first two books of Aristotle's *Physics* as a propaedeutic to the science of physics" (p. 105).

In Chapter 3, "The Subject-matter of *Physics*", pp. 111-212, Lammer presents his views on the difference between Avicenna and Aristotle on this point. When Avicenna claims that physics deals with the sensible body insofar as it is subject to change, he substantially modifies a well-known

Aristotelian heritage.[5] Avicenna lays emphasis on corporeal existence over susceptibility to motion and change, and for Lammer in so doing he "marks a first, and not merely accidental, difference between his treatment of principles and that of Aristotle in the *Physics*" (p. 112). At variance with Aristotle, Avicenna "does not arrive at his account of principles through an inquiry into change. (...) Instead, he puts forth the principles of natural things through the common notion of corporeality, because natural bodies are, first and foremost, corporeal. (...) Thus, although it is true that Avicenna follows Aristotle in accepting matter, form, and privation as the fundamental principles of natural things, he does not follow his predecessor's strategy for establishing them" (p. 113).

In an interesting paragraph entitled "Body, Substance, and Corporeality" (pp. 114-21) Lammer discusses the passages in the Avicennian corpus that elicit the claim that he "recognises four kinds of substances: matter, form, their composite, and soul (and a *fortiori* intellect)" (p. 115). Leaving aside the question of the genesis of this fourfold set of "substances" and the criteria underlying it,[6] and concentrating on the first item – 'matter' – the important point that emerges from Lammer's analysis is that 'matter' for Avicenna fully meets the criteria for being a substance.[7] Since the most general feature of body is "corporeality, *ǧismiyya*",[8] a natural body is simply an instance of what Avicenna labels "absolute body (*ǧism muṭlaqan*)" or "unqualified yet enmattered instance of the essence of body (*māhiyyat al-ǧism*)" (p. 121). The latter, if I am not wrong, coincides in Lammer's analysis with "corporeality", even though the issue is not entirely clear, at least to me. Lammer claims: "Avicenna's conception of body relies on the notions of continuity, extension, and divisibility, so that body as such is a continuous substance which is indeterminately extended into three dimensions and which, for this reason, is essentially divisible. Moreover, body is a substantial composite of an incorporeal and receptive matter, on the one hand, and of a 'corporeal form' (*ṣūra ǧismiyya*) on the other. It is precisely this corporeal form which is the principle and source of corporeality – i.e. of extension, continuity, and, in one sense at least, divisibility" (p. 121). The relationship between these notions is not clear to me. On the one hand, Lammer says in the passage just quoted that the corporeal form is "the principle and source of corporeality", thus eliciting the idea that for Avicenna the corporeal form is the cause for a body to be a body; however, if one tries to define what the "corporeal form" may amount to, one has no alternative to saying that it is continuity, extension, and divisibility. Hence, it seems that the various names refer to one and the same item, that one may call 'the principle of corporeality as such' and which is labelled *ǧismiyya*, *māhiyyat al-ǧism*, or *ṣūra ǧismiyya*.

However this may be, Lammer is right: the distance from Aristotle is evident. The consequence of Avicenna's reset of the Aristotelian physics is that subject-matter of this science is "absolute

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[5] Arist., *Phys*., III 4, 202 b 30-31: ἐστὶν ἡ περὶ φύσεως ἐπιστήμη περὶ μεγέθη καὶ κίνεσιν καὶ χρόνον. *De Cael*., I 1, 268 a 1-2: ἡ περὶ φύσεως ἐπιστήμη σχεδὸν ἡ πλείστη φαίνεται περί τε σώματα καὶ μεγέθη καὶ τὰ τούτων οὖσα πάθη.

[6] More details on the role played by Themistius, both in his paraphrases of Aristotle's *De Anima* and *Physics*, in my forthcoming book *Themistius and the Transmission of Aristotle. Teaching Philosophy from Late Antiquity to Early Modern Period.*

[7] Through critical discussion of the views of other scholars (A.-M. Goichon, P. Morewedge, C. Belo), Lammer arrives at the conclusion that "The reason for why matter is a substance is that there is nothing else underlying matter in which it exists as in a subject. There is no matter for matter and there is nothing in which matter itself inheres. Thus, matter is one of the four kinds of substance in Avicenna's ontology" (p. 119).

[8] "According to him the corporeality of a given body is not identical with its having a concrete set of dimensions. A body may change its dimensions, it may grow and diminish, it may become wide or narrow, it may change its shape – but it will remain a body throughout. In other words, the corporeality of a body remains unchanged regardless of any quantitative transformation a body may suffer" (p. 120).

body" endowed with extensionality, while change is only one of its features. Now, a point that has gained firm footing in scholarship is that it is with Philoponus that three-dimensionality becomes the distinctive feature of prime matter,[9] and in fact it is Avicenna's relationship with and reaction to Philoponus' prime matter that sheds light on the issue of *ǧismiyya*, *māhiyyat al-ǧism*, and *ṣūra ǧismiyya*. Philoponus had argued that the basic level of reality should not be conceived of as an incorporeal principle that undergoes change. Rather, for him such a basic level had to possess three-dimensionality; in other words, prime matter should be recognised as being a body – indeterminate, but a body. For Avicenna, instead, "the natural body insofar as it is a corporeal reality, is constituted by two fundamental principles. The first is the underlying matter which is in itself unextended and in no way already qualified other than by its being receptive of form. The second is the form which, at the most fundamental level of formal determinations, is called 'corporeal form', being tantamount to corporeal continuity as such. The combination of matter and corporeal form gives rise to what Avicenna sometimes calls an 'absolute body'. (...) This is Avicenna's understanding of corporeality, and the corporeal form is its source and principle" (pp. 153-4). Prime matter becomes again an incorporeal principle, that acquires three-dimensionality, thus becoming a body, because it is informed by the *ṣūra ǧismiyya*.

This paves the way to the idea that a given entity arises from multi-layer information of underlying matter, that is endowed first by corporeality, then from one or more substantial form(s). Such a theory was indeed formulated in Latin medieval philosophy as the theory of the multiplicity of forms (*pluralitas formarum*), that gave rise to complex, subtle, and very interesting controversies in the 13th century and later.[10] Alluding to this doctrine, Lammer castigates the scholarship past and present, from Étienne Gilson onwards, that envisages an influence of the Latin Avicenna on the development of this theory (pp. 166-9). It is Lammer's conviction that "the evidence found in Avicenna's writings suggests that Avicenna rejected the idea of a multiplicity of forms, so that the passages in which Avicenna speaks of 'other forms' existing in matter in addition to the corporeal form are loose locutions, employed by Avicenna for whatever reasons" (p. 169). This conclusion is quite feeble, and also the argument that "the multiplicity thesis would commit Avicenna precisely to the objection mentioned by Averroes that any substantial change would be downgraded to a mere instance of accidental change" (p. 170) does not sound particularly convincing: Averroes may, in the last resort, also have been right in pointing to such a consequence of Avicenna's position, and in any case the fact that a doctrine would expose a philosopher to an objection tells nothing about whether or not he actually held or implied that doctrine. The passages dismissed by Lammer as "loose locutions" give room, in any case, to the possibility that Avicenna's understanding of information of matter was that of a first information by the 'form of corporeality', followed by more specific layers of forms that make a given body to be such and such.[11]

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[9] F.A.J. de Haas, *John Philoponus' New Definition of Prime Matter. Aspects of its Background in Neoplatonism and the Ancient Commentary Tradition*, Brill, Leiden - New York - Köln 1997 (Philosophia Antiqua, 69).

[10] The medieval debate was heated chiefly because of its consequences for the human soul. The bibliography cannot be summarised here; for a still valuable introduction see D.A. Callus, "The Problem of Plurality of Forms in the Thirteenth Century. The Thomist Innovation", in *L'homme et son destin d'après les penseurs du Moyen Age*, Actes du premier Congrès International de Philosophie Médiévale, B. Nauwelaerts, Louvain-Paris 1960, pp. 577-85. There is also a treatise by Giles of Rome entitled *Liber contra gradus et pluralitatem formarum*; on the metaphysical issue at stake in this debate, cf. M. Pickavé, "Metaphysics", in Ch. Briggs - P. Eardley (eds.), *A Companion to Giles of Rome*, Brill, Leiden - Boston 2016 (Brill's Companions to the Christian Traditions, 71), pp. 114-49.

[11] In particular, the passage quoted at p. 169 from *al-Ḥikma al-ʿArūḍiyya*, where Avicenna says that "In the matter

The general picture emerging from this chapter is that corporeality is a form (*ṣūra ǧismiyya*, with *ǧismiyya* and *māhiyya al-ǧism* as other labels for the same concept) that informs prime matter, unextended pure potentiality; the outcome of this first information is the "absolute body" endowed with three-dimensionality.[12] All in all, it seems to me that Avicenna parts company with Philoponus, but relies on his basic picture: prior to the elemental bodies, there is something which is both indeterminate and three-dimensional: the "absolute body". Change as an "additional principle" (pp. 201-12) is analysed by Avicenna along lines that, rooted as they are in the Aristotelian *Physics*, give a different ring from it. Instead of having matter, form, and privation as the factors whose interplay accounts for change, "Privation (…) emerges as an accidental principle which is, just as the essential and constitutive principles matter and form, common in the generic sense of the word but not as a single, numerically one entity. Only agent and end are common in both senses of the term, as all natural things share in God as their single First Cause" (p. 212).

Chapter 4, "Nature and Power" (pp. 213-306) deals with *al-Samāʿ al-ṭabīʿī* I.5, the core of Avicenna's physics in Lammer's interpretation. This section of Avicenna's *Physics* is described twice as "extreme", in the sense that "it provides a new approach to the subject at hand that is not to be found in Aristotle nor anywhere else before Avicenna. Surely, even this 'new' approach is influenced by Aristotle, yet Avicenna's exposition must be credited with being as new and unprecedented as a Peripatetic account of the concept of nature could possibly be, even though he does not do much more than demonstrating his capacity for the subtle rearrangenement and systematisation of materials borrowed from the ancients. (…) The reason *al-Samāʿ al-ṭabīʿī* I.5 is extreme, therefore, in that it is, first, especially fresh in its approach, and, then, exceptionally direct in its execution" (p. 213).

Among those who "systematically equate the concepts of nature and soul" (p. 217) Lammer lists Alexander of Aphrodisias, but it is Philoponus who "reinterpreted Aristotle's definition of nature in light of his Neoplatonic conception of soul. (…) Philoponus' account was immensely influential among Arabic intellectuals of the third/ninth and fourth/tenth centuries in and around Baġdād. Moreover, it is Avicenna who find fault with this conception, reacting to an entire tradition of aligning soul with nature" (p. 218). Philoponus' Neoplatonic interpretation of the Aristotelian 'nature' consists in that it is put on equal foot with soul in its capacity to permeate everything with an active power of life; as a consequence, "all natural things, animate and inanimate alike, can be said to have an active inner principle of motion and rest" (p. 223). While acknowledging that the definition of 'nature' as a principle that "causes motion through itself" is "the aspect where Philoponus' influence on Avicenna is most significant" (p. 239), Lammer maintains that the influence of Philoponus' natural ῥοπή (*impetus*) on Avicenna – a well-known tenet of the Avicennian studies[13] – needs qualification: "despite the clear and strong influence which Alexander's and Philoponus' ideas about ῥοπή had on Avicenna's conception of *mayl*, Avicenna carefully differentiates between a number of notions which his predecessors either accidentally failed to distinguish or actively wanted

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of the natural body are other forms different from the corporeal form" seems to elicit this reconstruction. Readers of the Latin Avicenna like Albert the Great (an opponent of the plurality of substantial forms) or Duns Scotus (a supporter of the plurality) know of *a forma corporeitatis* that is reminiscent of Avicenna's *ṣūra ǧismiyya*; for Albert, cf. J. Paz Lima, "Prime Matter and *forma corporeitatis* in Albert the Great's *Physics*", *Pensamiento* 73 (2017), pp. 445-62; for Duns Scotus, cf. B. Vogt, "Note on the *forma corporeitatis* of Scotus", *Franciscan Studies* 3 (1925), pp. 43-8.

[12] On the fortune of Avicenna's *ǧismiyya* in the Muslim West, with special reference to Ibn Ṭufayl and his readers, cf. my *Le forme degli elementi. Isaac Abravanel e la tradizione aristotelica medievale*, Pisa U.P., Pisa 2018 (Greco, arabo, latino. Le vie del sapere. Studi, 7), pp. 141-5.

[13] The relevant literature is listed at n. 89 of p. 240.

to unite" (p. 251). Acting now as a commentator of Aristotle properly speaking, Avicenna embarks on a criticism of Philoponus' interpretation of the definition of 'nature' at *Phys*., II 1, 190 b 20-23. While Aristotle defines 'nature' as the principle and cause for something to be in motion and at rest, Philoponus claims that one should add the definition of what nature is, and advances his own (Neoplatonic) account of nature as the omnipervasive power, that has already been mentioned above. Lammer presents Avicenna's criticism, labelled "Avicenna's attack" (pp. 252-6) – even though what Avicenna does is less dramatic – as follows: "Avicenna offers a recapitulation of all relevant aspects of Philoponus' redefinition, in order to refute them, or, more precisely, to show their redundancy" (p. 255).[14] The emphatic term "attack" is maybe justified in the light of the subsequent development in Lammer's reconstruction. For him, Avicenna's target is an entire Neoplatonic tradition of interpreting 'nature' as "a power that pervades or permeates all natural bodies, and that governs or manages them" (p. 261) that reached through various channels the philosophers of the Muslim world. It is Lammer's conviction that "for Avicenna, then, Philoponus' account serves on a peg on which to hang his rejection of the idea of nature as an independent and maybe even all-encompassing, semi-divine, soul-like principle" (p. 271). Avicenna shared initially in this view, but at the end of an evolution in his thought[15] he rejected the idea of nature as "an active and substantial entity governing and shaping all natural affairs" (p. 278), replacing it with the idea that nature is "a power which produces motion and change, and from which the act proceeds in a single manner without volition (*al-Samāʿ al-ṭabīʿī* I.5, §3, 30.7f., tr. by McGinnis, modified)" (p. 300).

In Chapter 5, "Putting Surface Back into Place" (pp. 307-427), Lammer outlines Avicenna's notion of place against the background of the objections raised by Philoponus in the so-called *Corollarium de loco*, a long digression appended to the commentary of *Phys*., IV 4. Avicenna's allegiance to the Aristotelian doctrine of place is part and parcel of his anti-Philoponian stance: "Avicenna developed Aristotle's account so massively and carefully, that it could withstand and overcome each single one of Philoponus' objections. If Philoponus' *Corollarium de loco* constitutes the greatest attack on Aristotle's account, Avicenna's *al-Samāʿ al-ṭabīʿī* contains its greatest defence" (p. 308). While Aristotle construed 'space' as "the limit of the contained body" (*Phys*., IV 4, 212 a 6), Philoponus voices a series of aporias that were raised since the immediate successors of Aristotle, pointing (in addition to other puzzles about movement) to the fact that limit is a surface, hence bi-dimensional, whereas body is three-dimensional. For Lammer, Avicenna's vindication of the Aristotelian position is not only successful, but also innovative. Reworking the discussions of the late-antique commentaries – chiefly Philoponus – in the light of the muʿtazilite treatment of bodies and their features, of the accounts of the fellow-scientists of his age like al-Bīrūnī, and finally of al-Fārābī's treatise *On Void*, Avicenna restates Aristotle's conception of space against Philoponus' idea of space as an independently existing extension. "(…) there is no extension over and above the body, regardless of whether we call that extension space or void: first of all, there exists only the extension that belongs to the body. Since the body is supposed to be always filled, there are no grounds for another additional extension. (…) there is,

[14] Even later on Avicenna's critique is described as his endeavour to show that "Aristotle had said exactly what Philoponus did, and that, consequently, Philoponus' efforts were in vain" (p. 276).

[15] "He himself may have embraced the Neoplatonic understanding of nature just as his contemporaries in Baġdād have done and, just like them, may have been convinced of the similarity of nature and soul, insofar as both are powers that permeate through the bodies (…). Yet, he abandoned this position some time between 389/999, when he wrote *al-Ḥikma al-ʿArūḍiyya*, and 418/1027, when he composed *al-Naǧāt*. In between these years lies his work *al-Samāʿ al-ṭabīʿī*, which was probably completed around 412/1022, i. e., approximately twenty years after he had composed his first compendium *al-Ḥikma al-ʿArūḍiyya*" (p. 275).

then, nothing that corresponds to the assumed three-dimensional immaterial extension. (…) We must conclude, then, that there is no extension, no void, no space in any form, because conceiving of space is a mistake of the imagination; because it has no meaning and, thus, no definition; because it makes motion impossible; and because it is not required to explain the behaviour of natural bodies. The void is nothing, it is itself void – just as Aristotle has argued one-and-a-half thousand years earlier. As a result, the inner surface of the containing body is the only remaining option for the essence of place – i.e., the only option from the initial list of candidates which is neither incoherent nor non-existent, and which can easily account for all relevant natural phenomena experienced in the world" (p. 426).

Chapter 6 is devoted to "Time and Temporality in the Physical World" (pp. 429-524). Here again Lammer castigates past and present scholars for their presentation of Avicenna's notion of the 'now', which "has been essentially misunderstood"; for Lammer "its relevance for the existence of time has been greatly exaggerated in the secondary literature. (…) one of the main results of the following analysis is that Avicenna's account of time is more complex than interpreters have so far registered" (p. 430).

The complexity of Avicenna's position can be adequately appreciated on consideration that it is shaped not only by the Aristotelian notion, but also by what Lammer labels the "Neoplatonic model" of time. "As it seems, this twofold conception of time attempts to conjoin two historically opposing models, of which we may call one the 'Aristotelian model' and the other the 'Neoplatonic model'. In fact, the most remarkable achievement of Avicenna's temporal theory is that it gets the best of both worlds, the Neoplatonic and the Aristotelian. (…) Avicenna's philosophy emerges after even rigidly Peripatetic authors such as Boethus, Alexander, and Ibn ʿAdī, presumably inadvertently, departed from Aristotelian territory and ventured into the Platonic lands. What they took to be a definition of time derived from the *Physics* itself was in truth close to being the reverse. The time which they conceived as a duration numbered by motion (*mudda taʿudduhā l-ḥaraka*) is what a thorough Platonist would identify not with an accident of motion but with a substance that subsists independently of motion (*ǧawhar qāʾim bi-nafsihī wa-mustaqill bi-ḏātihī*) and which is measured out by the motion of the outermost sphere. (…) Like most of his predecessors, Avicenna seems to have not been aware of the Neoplatonic hues to a purportedly Aristotelian conception. To the contrary, the clear shift from regarding time as the measure or 'number of motion' (ἀριθμὸς κινήσεως), as Aristotle did, to regarding it as the magnitude of motion (*miqdār al-ḥaraka*), as Avicenna does, bears witness either to his oblivious acceptance of his predecessors' misunderstanding or, at least, to a clear influence of him by his predecessors, above all Alexander and Ibn ʿAdī" (pp. 512-13). This, however, according to Lammer "does not invalidate the compatibility" of Avicenna's "two definitions of time – it merely makes his temporal theory considerably more complex than so far recognised by previous interpreters, precisely because Avicenna, inadvertently or not, attempts to combine two apparently incompatible conceptions of time, one Aristotelian and the other Neoplatonic" (p. 513).

The 'Neoplatonic' notion of time involved in this account consists essentially in that time as the measure of the motion of the outermost sphere is a principle independent of and prior to all motions and all times. "I am not claiming that Avicenna's account of time is Neoplatonic. What I do claim is that his account is a Neoplatonic Peripateticism. Of course, Avicenna opposes the fundamental trait of any Neoplatonic conception of time, viz., that time is a self-subsisting substance. For him, time is and remains an accident of motion. This, then, is also the final arbiter that makes Avicenna's account Peripatetic: time is an epiphenomenon of motion and does explicitly not subsist independently as a Platonist would have it" (p. 514).

Two remarks are in order. First, in considering that for the Neoplatonists time is "a self-subsisting substance", Lammer operates a sort of synecdoche: not all Neoplatonists would agree that this definition applies to time, even though some do. To be more precise, it is true that for the post-Iamblichean

Neoplatonists like Proclus 'time' is a divine reality, at times also called οὐσία. Not so for Plotinus, however: for him, time is a feature of the visible world produced by the principle Soul[16] – a claim that Iamblichus and his followers, chiefly Proclus, did not accept,[17] but that resonates well with the repeated claims on Avicenna's part that the cause of the movement of the outermost sphere – hence, the cause of the cause of time – is the soul; no need to say, the cosmic soul, not the human one.[18] All this suggests that the Neoplatonic interpretation of time at work in Avicenna's account was basically Plotinus', with his insistence that it is soul that produces time. Themistius, who commented upon Aristotle's *Physics* and *De Anima* often telescoping into Aristotle's sentences ideas taken from Plotinus, in all likelihood contributed (directly or indirectly) to create Avicenna's conviction that time as prior to and cause of the countless bits of time in the sublunar world was Aristotle's own doctrine.[19]

Second, and more important for the present purpose, it seems to me that one should take into account in this picture also the relationship established in the pseudo-Aristotelian *Liber de Causis* – in itself derived from Proclus – between the sempiternal totality of time that characterises the movement of the outermost sphere and the bits of time that characterise the sublunar substances. In proposition 29 of the *Liber de Causis*, "Aristotle" says the following:

> Every substance originated in time is either perpetual in time and time is inseparable from it because it and time were equally originated; or it is separate from time and time is separate from it because it was originated in a certain moment of time. (...) It has become clear and evident, then, that there are some substances perpetual above time, there are some substances equal with time and time is inseparable from them, and there are some that are not continuous with time and time is separate from them both above and below, and these [latter] are substances falling under generation and corruption (trans. R.C. Taylor).[20]

I think that Lammer is basically right in describing Avicenna's account of time against the backdrop of what he labels "Neoplatonic Peripateticism"; but, if so, the *Liber de Causis* was particularly important for him, because it provided a model of inclusion of bits of time under the whole of time, that commended itself as issued from the First Teacher himself.

A Conclusion (pp. 525-31), an extended Bibliography, and a general index complete Lammer's all-embracing study. In this volume there are interpretations with which I do not concur, but more important is that there is much to learn from it, as I have done. Lammer's book is a rich, useful contribution to our field of research.

Elisa Coda

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[16] Time is defined by Plotinus as "the life of soul in a movement of passage from one way of life to another (ψυχῆς ἐν κινήσει μεταβατικῇ ἐξ ἄλλου εἰς ἄλλον βίον ζωήν)", trans. A.H. Armstrong, *Plotinus* with an English translation by A.H.A., III. Harvard U.P. - Heinemann, Cambridge (MA) - London 1984 (Loeb Classical Library), vol. III, p. 341.

[17] Proclus, *In Tim*., III, pp. 22.4-21 and 24.30-28.14 Diehl. Arguing against Plotinus that time is an instance of the intelligible realm prior to soul, Proclus also labels it an οὐσία (e.g. *In Tim*., III, p. 25.9 Diehl), obviously in the Neoplatonic meaning of 'hypostasis', not in the sense of an Aristotelian 'substance'.

[18] "Time is dependent upon one single motion. This motion is the one without which all other motions could not exist. (...) this one motion is the motion which gives all motions their direction. Thus, the motion in question is the circular motion of the outermost sphere, whose body, Avicenna adds, produces time through its motion (*al-fāʿil bi-ḥarakatihī li-l-zamān*), as he writes here in *al-Samāʿ al-ṭabīʿī*, and preserves time (*yaḥfaẓu al-zamān*), as he remarks in *al-Samāʿ wa-l-ʿālam*. It is this motion which is the cause of the existence of time, while soul is the cause for this motion thereby being the cause of the cause of time (*ʿillat ʿillat al-zamān*), as Avicenna put it in the *ʿUyūn al-ḥikma*" (p. 504).

[19] More details in the book cited above, n. 6.

[20] St. Thomas Aquinas, *Commentary on the Book of Causes* translated by V.A. Guagliardo O.P., Ch.R. Hess O.P., and R.C. Taylor, The Catholic University of America Press, Washington, D.C. 1996, pp. 167-8.

Finito di stampare nel mese di dicembre 2019
presso le Industrie Grafiche della Pacini Editore S.p.A.
Via A. Gherardesca • 56121 Ospedaletto • Pisa
Tel. 050 313011 • Fax 050 3130300
www.pacinieditore. it