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The Elements of Avicenna's Physics

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The Elements of Avicenna's Physics



Greek Sources and Arabic Innovations

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To my parents, Ingrid and Herbert Lammer,
with gratitude.

So eine Arbeit wird eigentlich nie fertig;
man muß sie für fertig erklären,
wenn man nach Zeit und Umständen
das Möglichste gethan hat.

Johann Wolfgang von Goethe
in Caserta am 16. März 1787

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List of Abbreviations

Plato

Alc. I	Alcibiades I
Leg.	Laws
Parm.	Parmenides
Phd.	Phaedo
Phdr.	Phaedrus
Plt.	Politicus
Rep.	Republic
Tim.	Timaeus

Aristotle

Cat.	Categories
De int.	De interpretatione
An. pr.	Prior Analytics
An. post.	Posterior Analytics
Top.	Topics
De soph. el.	De sophisticis elenchis
Rhet.	Rhetoric
Poet.	Poetics
Phys.	Physics
Cael.	De caelo
De gen. et corr.	De generatione et corruptione
Meteor.	Meteorologica
De an.	De anima
De mem.	De memoria et reminiscencia
Hist. anim.	Historia animalium
De part. anim.	De partibus animalium
De motu anim.	De motu animalium
De gen. anim.	De generatione animalium
Met.	Metaphysics
Eth. Nic.	Nicomachean Ethics
Eth. Eud.	Eudemian Ethics

Plotinus

Enn.	Enneads
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Preface

This study is an examination of texts of historic value, in particular those that were composed by the philosopher and physician Avicenna (d. 428/1037). For this reason, it relies heavily on quoting, reading, translating, and understanding passages from primary texts. The following rules have been adopted in presenting and working with these passages.

Passages in quotation are presented in their original language together with an English translation. In the case of Aristotle, texts are quoted in Greek and English together with a historical Arabic translation, if extant and available.¹ Given that some of Aristotle's works were more than once translated into Arabic, in addition to the lack of reliable, or in any way precise, information about which translations Avicenna used and knew, it must be noted that the Arabic versions of passages from Aristotle that are quoted in this study may not necessarily be those which Avicenna was most familiar with or primarily worked from. This is especially true in the case of the *Physics*.² At the same time, it should be clear that simply *any* Arabic translation from the second/eighth to the fourth/tenth century provides a modern interpreter with valuable information about a certain terminology and understanding that was used to render the Greek text into Arabic at around Avicenna's own times.

In this regard it is to be noted, too, that the historical Arabic translations may naturally deviate from our established Greek texts in various respects. Such differences are only occasionally mentioned, as it is not the subject of this study to assess the quality and accuracy of the Arabic translations or of the Greek manuscripts and Syriac intermediaries from which they were produced. Moreover, such remarks are clearly only of limited value in a study on Avicenna's philosophy as long as we continue to lack reliable information about which translations he primarily relied on in his philosophical education and formation.

All Greek texts are quoted following the available, often critical, editions listed in the bibliography. Arabic texts are quoted on the basis of the available, rarely critical, editions listed in the bibliography but have silently been adapted so as to conform to a consistent orthography and punctuation.

The transliteration of Arabic terms follows, for the most part, the rules laid down by the Deutsche Morgenländische Gesellschaft. Exceptions include the handling of sun letters (e.g., *al-ṭabī'a* instead of *aṭ-ṭabī'a*) and of diphthongs (*aw* and *ay* instead of

¹ If a quoted passage is provided in three languages, then the English translation at the *bottom* always translates the version on *top*, and not that of the version between these. So, if the order of the versions of a given passage is Greek-Arabic-English, then the English translation at the bottom renders the Greek text on top, whereas if the order is Arabic-Greek-English, then the English translation at the bottom renders the Arabic text on top.

² q.v. below, 37ff.

au and *ai*). In the transliteration of Persian terms, I decided against classicising the spelling, taking my cue from contemporary pronunciation (e.g., *ketāb* instead of *kitāb*).

Furthermore, I took the liberty of adding Greek and Arabic terms in brackets at any time and to any quotation, be that from primary texts or from the secondary literature. Likewise, I have allowed myself the removal of any such earlier addition by the original editor, translator, or author from a quoted passage, if I deemed it inadequate or distracting.³

It often happens that I quote from an earlier published translation and indicate that this translation has been “modified.” This can mean either that the text of the earlier translation has been *slightly* modified (such as changing the tense of a verb or replacing a noun) or that it has been *heavily* modified (such as changing the structure of the sentence). As it is, most quoted translations have been modified, not only in order to provide what I consider to be a better or more correct translation but also to obtain a clear and straightforward terminology throughout this study. Terms such as ἀρχή and *mabdaʿ*, for example, have been translated usually and consistently as “principle,” even though other translators, in various contexts, chose different expressions, such as “beginning,” “source,” and “origin.”

In my own translations, I often strive to follow the Arabic original closely, even in its syntax and word order.⁴ On occasion, the resulting translations may appear to be less fluent, or pleasant, in English but, so I hope, no less adequate for a thorough examination of text, thought, and terminology.

As a rule, references to primary texts always indicate the title of the work, the part, the chapter, and the subsection, if applicable, to which a certain passage refers or from which a given translation has been taken *in addition* to page numbers with line numbers. It is my sincere belief that modern scholarship would benefit from a strict observance of this rule.

Aristotle’s works are referenced with their established English or Latin titles: for example, *Posterior Analytics*, *Physics*, *De generatione et corruptione*, and *De anima*. Corresponding titles of Avicenna’s works are always given in their transliterated Arabic form: for example, *al-Burhān*, *al-Samāʿ al-ṭabīʿī*, *al-Kawn wa-l-fasād*, and *al-Nafs*. If the title of an Arabic work of another author is identical with, or too similar to, the title of one of Avicenna’s works, then the former is given in English translation, instead of the transliterated Arabic, in an attempt to avoid confusion: for example, Abū Naṣr al-Fārābī’s *Kitāb al-Burhān* is referred to as *Book of Demonstration*.

³ In like manner do I quote from Gutas’ *Avicenna and the Aristotelian Tradition* without keeping the capitalisation of technical terms, which is pointless to retain anywhere outside the original work.

⁴ cf. also the advice given by Gutas in “The Study of Avicenna,” 55.

With regard to Aristotle's works, I quote from the following Arabic translations:

- *Posterior Analytics*: Abū Biṣr Mattā ibn Yūnus on the basis of a Syriac translation by Ishāq ibn Ḥunayn; published by Badawī and by Ġabr.
- *Rhetoric*: an unknown translator; published by Badawī and by Lyons.
- *Physics*: Ishāq ibn Ḥunayn presumably on the basis of a Syriac translation either by himself or by his father Ḥunayn ibn Ishāq; published by Badawī.⁵
- *De caelo*: Yaḥyā ibn al-Biṭrīq (somewhat revised) on the basis of an unknown Syriac translation; published by Badawī.⁶
- *De generatione et corruptione*: Ishāq ibn Ḥunayn on the basis of a Syriac version by his father Ḥunayn ibn Ishāq; extant in a Hebrew and a Latin translation, the latter of which was produced by Gerard of Cremona and still remains unpublished.⁷
- *De anima*: an unknown translator, erroneously attributed to Ishāq ibn Ḥunayn; published by Badawī.⁸
- *De partibus animalium*: Uṣṭāṭ, erroneously attributed to Yaḥyā ibn al-Biṭrīq, on the basis of an unknown Syriac translation; published by Kruk.⁹
- *De generatione animalium*: Uṣṭāṭ, erroneously attributed to Yaḥyā ibn al-Biṭrīq, on the basis of an unknown Syriac translation; published by Brugman and Drossaart Lulofs.¹⁰
- *Metaphysics*: primarily Uṣṭāṭ, preserved in the lemmata of Averroes' *Tafsīr Mā ba'd al-ṭabī'a*; published by Bouyges.¹¹
- *Nicomachean Ethics*: Ishāq ibn Ḥunayn (for books I–IV) probably on the basis of a Syriac version by his father Ḥunayn ibn Ishāq as well as Uṣṭāṭ (for books V–X); published by Badawī and by Akasoy and Fidora.¹²

⁵ For more information on the transmission of Aristotle's *Physics*, q.v. below, 9ff.

⁶ cf. Endreß, "Averroes' *De Caelo*," 47f.

⁷ cf. Eichner's remarks in the introduction of her edition of Averroes, *Mittlerer Kommentar zu Aristoteles' De generatione et corruptione*, 1–6. I am grateful to Marwan Rashed, who kindly provided me with his personal transcript of Gerard of Cremona's Latin translation, which I shall quote in lieu of Ishāq ibn Ḥunayn's not extant Arabic version.

⁸ For a discussion of the attribution to Ishāq ibn Ḥunayn, cf. Frank, "Some Fragments of Ishāq's Translation of the *De anima*"; Gätje, *Studien zur Überlieferung der aristotelischen Psychologie im Islam*, 20–44.

⁹ For a discussion of the attribution to Yaḥyā ibn al-Biṭrīq, cf. the remarks by Brugman and Drossaart Lulofs as well as Kruk in their respective editions of the Arabic translations of Aristotle's *De generatione animalium*, 1–10; *De partibus animalium*, 18–23. For the attribution to Uṣṭāṭ, cf. the extensive discussion in Ullmann, *Die Nikomachische Ethik des Aristoteles in arabischer Überlieferung*, vol. 2, 15–56.

¹⁰ q.v. the preceding footnote.

¹¹ For a discussion of the various translations of Aristotle's *Metaphysics* and of those preserved and attested through Averroes' commentary, cf. Bertolacci, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb al-Šifā'*, ch. 1, being a moderately reworked version of his earlier article "On the Arabic Translations of Aristotle's *Metaphysics*."

¹² For the textual transmission of the *Nicomachean Ethics*, cf. the extensive discussion in Ullmann, *Die Nikomachische Ethik des Aristoteles in arabischer Überlieferung*, vol. 2, 15–56.

With regard to Avicenna's works, I use the following editions and cite according to the following pattern:

- *al-Ḥikma al-'Arūḍiyya*: Title, part, chapter, page, line; following Šālih's edition.¹³
- *'Uyūn al-ḥikma*: Title, part, chapter, page, line; following Badawī's first edition from 1954.
- *Kitāb al-Ḥudūd*: Title, paragraph, page, line; following Goichon's edition.
- *al-Mabda' wa-l-ma'ād*: Title, part, chapter, page, line; following Nūrānī's edition.
- *al-Hidāya*: Title, part, chapter, page, line; following 'Abduh's edition.
- Works from *al-Šifā'* are quoted by title, book, chapter, page, line; following the "Cairo edition" of *al-Šifā'*; with the exception of:
 - *al-Samā' al-ṭabī'i*: Title, book, chapter, paragraph (of McGinnis' edition and translation) with both page and line (of the Cairo edition by Zāyid).
 - *al-Ilāhiyyāt*: Title, book, chapter, paragraph (of Marmura's edition and translation) with both page and line (of the Cairo edition by Qanawātī, Zāyid, Mūsā, and Dunyā).
- *al-Nağāt*: Title, part, section chapter, page, line; following Dānešpažūh's edition.¹⁴
- *Dānešnāme-ye 'Alā'i*: Title, part, chapter, page, line; following the editions by Mo'in and Meškāt.
- *al-Ḥikma al-mašriqiyya*: Title, part, chapter, page, line; following the editions by al-Ḥaṭīb and al-Qatlān (for logic), and by Özcan (for physics).¹⁵
- *al-Išārāt wa-l-tanbihāt*: Title, part, chapter, section, page, line; following Forget's edition.¹⁶

13 The chapters on physics in *al-Nağāt* are largely identical with those in *al-Ḥikma al-'Arūḍiyya*. I shall refer to *al-Nağāt* in the main body and supply the corresponding passages of *al-Ḥikma al-'Arūḍiyya* in the footnote.

14 Dānešpažūh's division of the work into eleven *ağzā'* (sg. *ğuz'*) should be disregarded, as that division has no correspondence whatsoever with the content of the work and presumably reflects some arbitrary division – into quires (*ağzā'*)? – in the manuscript which Dānešpažūh used as the basis for his edition (manuscript *dāl*); cf. his remarks in the introduction to his edition (xcix). Other than that, Dānešpažūh did not edit the part on mathematics, which in his edition is provided only in the form of a facsimile from manuscript *dāl*, perhaps because this part was not written by Avicenna himself but was compiled by his closest disciple Abū 'Ubayd al-Ğüzğānī; cf. Gutas, *Avicenna and the Aristotelian Tradition*, 422–424.

15 I would like to express my gratitude to Jules Janssens for providing me with a copy of Özcan's doctoral dissertation containing the edition.

16 Avicenna's *al-Išārāt wa-l-tanbihāt* is commonly referenced as if it were a work consisting of four parts, viz., logic, physics, metaphysics, and mysticism. This fourfold division seems to have been introduced through Dunyā's four-volume edition of the text and gained prominence through the widespread use of that edition. This, however, is a habit which is entirely misled and must be avoided. Avicenna's *al-Išārāt wa-l-tanbihāt* does not consist of four but of two parts, viz., logic and all the rest, and should be quoted accordingly.

Occasionally, I have compared the editions of Avicenna's works, in particular of his *al-Šifā'*, with manuscripts at my disposal.¹⁷ My comparison, however, did not follow a systematic rule nor did I consistently compare every passage that I quote. I drew upon the manuscripts only when the text established by the editions appeared to be especially dissatisfying. In a number of cases, I preferred readings found in these manuscripts to those found in the editions. These cases are always noted in the footnotes.

Two final remarks: first, in my footnotes, I use the Latin abbreviation "cf.," in order to refer to further evidence in another work or study. In doing so, I do not observe and emulate the distinction between "see" and "cf." and, for this reason, only use the latter. Second, the fact that I do not make use of feminine pronouns when, for example, referring to a generic person ("a student of nature ... *he* may acquire knowledge ...") should not be interpreted as displaying a sexist or anti-feminist stance. With my native German background, I find it more convenient and less confusing to use masculine pronouns, hoping that the reader is not offended by this idiosyncrasy or – failing that – accepts my apologies.

¹⁷ Especially the manuscripts Leiden or. 4 and or. 84 proved to be helpful in assessing the text of the Cairo edition of *al-Šifā'*. Neither of them has been taken into consideration by previous editors of the work. On these manuscripts, cf. Witkam, "Avicenna's Copyists at Work." Due to the close textual relation between the works contained in Avicenna's *al-Šifā'*, on the one hand, and Avicenna's later composition *al-Ḥikma al-mašriqiyya*, on the other, it is evident that any future critical edition of one of the works contained in *al-Šifā'* needs to investigate the text of the manuscripts that preserve *al-Ḥikma al-mašriqiyya* and examine the *variae lectiones* they provide. In this study, however, I abstained from comparing the text of the section on physics of *al-Ḥikma al-mašriqiyya*, as established in Özcan's edition, with the texts contained in the editions of *al-Samā' al-ṭabī'i* and the two mentioned Leiden manuscripts of *al-Šifā'*, because Özcan's edition, despite all its merits, is full of mistakes and typographical errors and, thus, greatly unreliable.

Acknowledgements

I always like to read the acknowledgements of academic books, because they show so vividly that we never walk alone, that the human desire for knowledge and more complexity in understanding is a group effort, and that we should not be ashamed to admire the truth and to acquire it from wherever it comes, even if it should come from distant nations and foreign peoples.

Besides, I think they are a fantastic place for expressing one's sincere gratitude to those people without whom the present book would have been much worse and the process of writing it much more painful. It is in this sense, then, that I thank most sincerely two excellent mentors and supervisors: Peter Adamson and Dag Nikolaus Hasse. I am immensely grateful that it was them who guided my readings, corrected my mistakes, and also – years ago – instilled and, then, promoted my interest in Avicenna and the history of Arabic philosophy and science.

Secondly, I would like to express my gratitude to a number of friends who kindly provided me with their help during the last years of working on Avicenna's natural philosophy and to whom I am immensely indebted in various ways. These are: Jon McGinnis, Fedor Benevich, Hanif Amin Beidokhti, and Nora and Alexander Kalbarczyk.

Furthermore, I have received help from a number of people who devoted their time to reading earlier drafts of this book. Their remarks were gratefully received and I did my best to implement them into the text. My thanks go, above all, to Bethany Somma and Jens Ole Schmitt as well as to Nadja Germann and Benjamin Morison. I am also grateful to Marwan Rashed, who was so kind to include my book in his excellent series *Scientia Graeco-Arabica*, to read the manuscript, and to send me a number of insightful comments from which I could profit very much in the final stages of completing the book.

I wrote this book as a doctoral fellow at the *Munich School of Ancient Philosophy* (MUSAΦ) at the LMU Munich. Consequently, I would like to express my gratitude for the generous institutional support and even more for the valuable comments and remarks I have received on numerous occasions from my friends and colleagues there. In particular, I would like to mention Christof Rapp, Oliver Primavesi, Rotraud Hansberger, Matteo Di Giovanni, Laura Castelli, Christian Pfeiffer, Davlat Dadikhuda, Máté Herner, Jonathan Greig, Mirjam Engert Kotwick, Mareike Jas, and Christopher Noble.

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Moreover, during the last years of attending conferences and other academic events, I have had the pleasure to meet many colleagues and friends who both encouraged me to continue my work and provided helpful comments in numerous conversations.

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Finally I am grateful to my family, Katja, Henri, and Jarne, especially for their patience; to my older brother, Martin, for challenging all this history of philosophy caboodle and for eventually letting me convince him that it is, after all, fairly interesting and worthwhile; and to my parents, Ingrid and Herbert Lammer, for their guidance, education, encouragement, and constant support.

Far from comparing *The Elements of Avicenna's Physics* with the masterful *Iphigenie auf Tauris*, I am deeply sympathetic to the sentiment Goethe expressed about his own work in the lines I chose as the epigraph of this book, and duly acknowledge all remaining shortcomings as being due to the limitations of time and circumstances as well as of my own possibilities.

Thank you very much.

Andreas Lammer
Munich, December 2017

Introduction

It is the aim of this study to analyse the core concepts of Avicenna's physics. Particular attention is devoted to a work called *al-Samā' al-ṭabī'ī*, which is the first section (*fann*) of the second part (*ḡumla*) of Avicenna's comprehensive collection *al-Šifā'* and, by all appearance, was the first section to be written and completed around the year 412/1022. In his *al-Samā' al-ṭabī'ī*, Avicenna formulated his most extensive account of physics in general, and of the concepts of matter and form, nature, motion, place, and time in particular. It is for this reason that this work is at the heart of this study.

Avicenna also authored a number of less exhaustive, even if not necessarily less complete, philosophical compendia, viz., *al-Ḥikma al-'Arūḍiyya*, *'Uyūn al-ḥikma*, *al-Hidāya*, *al-Nağāt*, *Dānešnāme-ye 'Alā'ī*, *al-Ḥikma al-mašriqiyya* and *al-Išārāt wa-l-tanbihāt*. Some of these works have been neglected by modern scholarship almost in their entirety.¹ In this study, it is my firm intention to consider all these eight works, and to compare, contextualise, and assess their respective contents in an attempt to provide a full and coherent picture of the key concepts of Avicenna's natural philosophy. In addition to that, other sections of *al-Šifā'*, in particular *al-Ilāhiyyāt*, *al-Samā' wa-l-'ālam*, *al-Kawn wa-l-fasād*, *al-Burhān*, and *al-Maqūlāt*, are often consulted, as they provide important information without which many details cannot adequately be evaluated or even understood.²

1 Of these, only *al-Nağāt* and, especially, *al-Išārāt wa-l-tanbihāt* now have spurred the interest of scholars, while only *al-Išārāt wa-l-tanbihāt* and the *Dānešnāme-ye 'Alā'ī* have been published in their entirety in modern translation. Avicenna's *al-Ḥikma al-mašriqiyya* is a special case in its almost universal neglect, as it still seems to be the established opinion that it is "lost except for its inlogic [sic!]" (Endreß, "The Cycle of Knowledge," 119), despite that it appears to be largely extant except for its metaphysics. In fact, the sections on physics from *al-Ḥikma al-mašriqiyya* have been edited by Özcan as part of his 1993 Turkish doctoral dissertation almost twenty-five years ago, and also Hasse showed in his 2000 monograph *Avicenna's De Anima in the Latin West* how the transmitted text of the psychological sections of *al-Ḥikma al-mašriqiyya* can be put to great use in an examination of Avicenna's philosophy in general, and of the arguments in *al-Šifā'* in particular. In terms of its physics, it is plainly clear that *al-Ḥikma al-mašriqiyya* is overall very similar to – not to say largely identical with – what Avicenna set forth in his other works, and primarily consists of a series of shorter and longer quotations from different chapters of *al-Samā' al-ṭabī'ī*, joined by a number of explanatory or connecting phrases. A detailed comparison shows that in composing his *al-Ḥikma al-mašriqiyya*, Avicenna's reliance on the text of his own *al-Šifā'* is greater than even Gutas suggested (cf. "Avicenna's Eastern ('Oriental') Philosophy," esp. 178–180). Here in this study, I decided not to mark all the many identical passages that can be found in these two works and, instead, to refer to *al-Ḥikma al-mašriqiyya* in just the same manner as I refer to Avicenna's other works as providing further evidence. However, I am currently working on an article – tentatively titled "Avicenna's Oriental Physics Unmasked: The Truth about *al-Ḥikma al-mašriqiyya*" – in which I shall examine the content of *al-Ḥikma al-mašriqiyya*, also in comparison to *al-Samā' al-ṭabī'ī*, in more detail.

2 It is a perplexing datum of reality that, even despite the commonly acknowledged importance of *al-Šifā'* as such, most of its volumes have so far not been published in modern translation and are often

Avicenna's *al-Samā' al-ṭabī'i* 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 *Φυσικὴ ἀκρόασις*, in Arabic *Sam' al-kiyān* or *al-Samā' al-ṭabī'i* and in English *Lecture on Physics* or simply *Physics*. 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. With regard to Avicenna's *al-Šifā'*, then, the contents of *al-Samā' al-ṭabī'i* lay the foundation for the more specific investigations carried out in the particular disciplines presented in *al-Samā' wa-l-'ālam*, *al-Kawn wa-l-fasād*, *al-Af'āl wa-l-infi'ālāt*, *al-Ma'ādin wa-l-ātār al-'ulwiyya*, *al-Nafs*, *al-Nabāt*, and *al-Ḥayawān*.³ Together, these eight disciplines complete the scientific area of *al-Ṭabī'īyyāt*: the philosophy concerned with "natural [things]" – i.e., natural philosophy.

Since Avicenna's various works on physics provide us with insights into his personal reading of Aristotle's *Physics*, and into his own appropriation of Aristotelian physics and natural philosophy, any engagement with Avicenna's texts recommends a preceding engagement with Aristotle's writings on these subjects as well as with a range of further works from the philosophical tradition they initiated. It is for this reason that I shall make constant use of Aristotle's *Physics* alongside a number of Greek and Arabic sources which, in one way or another, comment on or expound Aristotle's work in a way that helps us understand and contextualise the various views and positions which Avicenna presented and discussed in his major works, especially in his *al-Samā' al-ṭabī'i*. That said, I shall *never* intend to engage in an attempt to understand or to interpret Aristotle's *Physics* in light of Avicenna's works. To put it simply: Aristotle's *Physics* is a valuable resource for understanding Avicenna's *al-Samā' al-ṭabī'i* – but not vice versa. Consequently, I consider Avicenna as a Peripatetic and a genuine follower of Aristotle, even though his positions may often not be genuinely Aristotelian.⁴ 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

only marginally treated – if at all – by western scholars. Notable exceptions include *al-Ilāhiyyāt* (with several translations) and *al-Samā' al-ṭabī'i* (translated by McGinnis in 2009).

³ Most of these works correspond thematically to a work from the canon of Aristotle's writings. For example, Avicenna's *al-Samā' wa-l-'ālam* corresponds to Aristotle's *De caelo*, *al-Kawn wa-l-fasād* to *De generatione et corruptione*, *al-Nafs* to *De anima*. The cases of *al-Af'āl wa-l-infi'ālāt*, *al-Ma'ādin wa-l-ātār al-'ulwiyya*, *al-Nabāt*, and *al-Ḥayawān* are more complicated; cf. also Gutas, *Avicenna and the Aristotelian Tradition*, 103–105.

⁴ Here I adopt and follow Hasse's distinction between the adjectives "Aristotelian" and "Peripatetic" as a means to describe Aristotle's "Aristotelian" doctrines as opposed to the "Peripatetic" interpretations of his followers and commentators; cf. Hasse, *Avicenna's De Anima in the Latin West*, x. An analogous distinction is applied to Plato's "Platonic" doctrines as opposed to later "Platonist" or "Neoplatonic" appropriations.

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 to develop Aristotle.⁵

This understanding of the place of Avicenna's works within the history of Peripatetic philosophy, and of the relation between the Aristotelian corpus and the Avicennian oeuvre, leads to a simple but crucial question: is Avicenna's natural philosophy as rich and innovative as his logic and his metaphysics already proved to be? As it happens, this is a question which has not yet received an adequate answer, even though, given the fruitful research on other areas of his philosophy, it clearly deserves a thorough investigation.⁶ In fact, it appears that in the field of natural philosophy in general, and of physics in particular, Avicenna's contributions are not widely acknowledged. It seems to be commonly believed that Avicenna simply was a follower of Aristotle and that, for this very reason, his physical theory is just Peripatetic. While it is certainly correct that Avicenna is – and, more importantly, that he considered himself to be – a follower of Aristotle, and while it is also true that his physical theory is Peripatetic, it is not *just* Peripatetic or *simply* so. In fact, it is *prima facie* unreasonable to assume that someone of Avicenna's stature should have been so absolutely ingenious in certain fields of philosophy and science but utterly dull and uninteresting in another.

However, this does not mean that *no* study of Avicenna's natural philosophy has so far been undertaken that would highlight his originality in this field. During the last couple of years, a number of insightful and accurate studies on various aspects have been published in the West, in particular by two scholars: Jon McGinnis and Ahmad Hasnawi.⁷ Their contributions provide valuable information on certain concrete aspects of, and novel insights in, Avicenna's physics, ranging from the structure of his *al-Samā' al-ṭabī'ī* as a whole to specific concepts and their history in Greek, Arabic, and Latin philosophy (as, for example, the concepts of motion or time), and to

5 It is interesting to note nonetheless that contemporary Aristotelian interpretations sometimes arrive at conclusions which, incidentally, resemble those found in Avicenna. Two striking examples are Morison's solution to the question about the place and motion of the outermost sphere, set out in his *On Location*, and Roark's interpretation of Aristotle's definition of motion and its relation to time, elaborated in his *Aristotle on Time*.

6 Apart from Marmura's articles collected in *Probing in Islamic Philosophy*, the pioneering studies on Avicenna's metaphysics, in particular as developed in *al-Ilāhiyyāt*, and on the ways in which Avicenna conceived of the text of Aristotle's *Metaphysics*, restructured its contents, interpreted its concepts in light of other sources in the preceding Greek and Arabic traditions, and formed his own understanding of the ontology of the world are Wisnovsky, *Avicenna's Metaphysics in Context*, and Bertolacci, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb al-Šifā'*. Regarding Avicenna's logic, perhaps the best overview is given in Street, "Arabic Logic." The importance of Avicenna as a logician has already been acknowledged fifty years ago by Rescher; cf. *The Development of Arabic Logic*, esp. 50.

7 cf. esp. Hasnawi, "La dynamique d'Ibn Sīnā"; "La définition du mouvement dans la *Physique* du *Šifā'* d'Avicenne"; "La *Physique* du *Šifā'*"; "Le statut catégoriel du mouvement chez Avicenne"; "La théorie avicennienne de l'*impetus*"; McGinnis, "Ibn Sīnā on the Now"; "Positioning Heaven"; "A Penetrating Question"; "Avoiding the Void"; "Avicennan Infinity"; "Avicenna's Natural Philosophy."

particular arguments within Avicenna's discussions (as, for example, the proof against circular motion in a void). Nonetheless, what has so far been missing is a study of the foundations of Avicenna's natural philosophy (i) as a whole, (ii) in all his major works, and (iii) in light of the preceding Greek and Arabic traditions. Providing such a study has become the aim of this monograph.

Avicenna's *al-Samā' al-ṭabī'ī* consists of four books (*maqālāt*, sg. *maqāla*). All the basic concepts of natural philosophy are discussed within the first two books.⁸ It is an investigation into these concepts which forms the core of the present study. More precisely, it examines Avicenna's accounts of corporeality, matter, form, and privation (in chapter three); nature and inclination (in chapter four); place, space, and void (in chapter five); and time (in chapter six). In addition to that, Avicenna's way of presenting his thoughts in *al-Samā' al-ṭabī'ī*, in particular those on matter and form, together with the fact that the first chapter in both Aristotle's *Physics* and Avicenna's *al-Samā' al-ṭabī'ī* is devoted to methodological concerns of inquiry, argumentation, and presentation within the area of natural philosophy, made it necessary to investigate the overall method adopted in *al-Samā' al-ṭabī'ī* as a whole (in chapter two).

There are two concepts which I decided not to investigate in detail, viz., the concepts of motion and causation. The primary reason for leaving Avicenna's account of motion aside is that there are already two studies which have considerably furthered our understanding of this subject, viz., Hasnawi's article "La définition du mouvement dans la *Physique* du *Šifā'* d'Avicenne" and Robert Wisnovsky's monograph *Avicenna's Metaphysics in Context*.⁹ In the former, Hasnawi not only offered an accurate treatment of Avicenna's notion as expressed in his *al-Samā' al-ṭabī'ī* but also provided valuable material about the history of the definition of motion from Aristotle through the commentators up to Avicenna and, among other things, highlighted the influence of Themistius, John Philoponus, and Abū Naṣr al-Fārābī on Avicenna's views on motion. Wisnovsky, on the other hand, meticulously analysed Avicenna's understanding of "perfection," "actuality," or "entelechy" (ἐντελέχεια, *kamāl*) which, since Aristotle, had been the central notion within the definition of motion. While Avicenna's account of motion is not investigated in this study *as such*, it will, nonetheless, figure prominently and frequently be mentioned, outlined, or discussed in various contexts, so

⁸ These first two books correspond to the first four books of Aristotle's *Physics*; cf. also Hasnawi, "La *Physique* du *Šifā'*." The third book of *al-Samā' al-ṭabī'ī* is concerned with questions that arise from the notion of continuity with regard to natural things and, thus, thematically relates in various ways to matters discussed in *Physics* V–VI. It contains, for example, a refutation of atomism (chs. 2–5) and a discussion of the infinite (chs. 8–9) along with a number of important issues that relate to the notion of quantity in natural things, such as the finitude of power (ch. 10) and the finitude of natural motion (ch. 14). The fourth book, then, is more miscellaneous in content and provides a number of various, even though important, studies, most of which are concerned with some aspect of motion, such as the numerical unity of motion (ch. 3), contrary motions (ch. 6), accidental (ch. 13) and forced motions (ch. 14), thus relating, more or less, to Aristotle's examination of motion in *Physics* VII–VIII.

⁹ cf. now also Ahmed, "The Reception of Avicenna's Theory of Motion in the Twelfth Century."

that the core idea of Avicenna's account of motion will eventually have been treated *en passant*. On the other hand, Avicenna's discussion of causation in *al-Samā' al-ṭabī'ī*, have only peripherally been taken into consideration, primarily because Avicenna's main exposition of causation and the categorisation of causes is carried out in book six of his *al-Ilāhiyyāt*.¹⁰ Although Avicenna frequently refers to different kinds of cause throughout his writings, and although he offers a distinct treatment of causes in the first book of *al-Samā' al-ṭabī'ī*, questions about causation are not as such investigated in *al-Samā' al-ṭabī'ī*. Having said this, the notion of cause – in particular in its application to matter and form, to nature, and to God, for example – is at appropriate places integrated and discussed.¹¹

In addition, this study does not contain an examination of Avicenna's treatment of the infinite.¹² Although the infinite was an integral part of the first half of Aristotle's *Physics*, having been treated exhaustively in the third book, Avicenna moved it to what he considered to be a more appropriate place, viz., the discussion of continuity in relation to the natural bodies insofar as they have quantity, inspired by Aristotle's treatment in *Physics* V–VI and carried out in the third book of *al-Samā' al-ṭabī'ī*. That is to say, the infinite is itself not a fundamental concept of natural things alongside, for example, motion, time, and place, or even a principle alongside matter and form. Instead, it is a subordinate feature, i.e., a feature that follows from concepts that truly are fundamental and which, in one way or another, relate to the category of quantity, especially motion and magnitude.

Apart from the noted exceptions, this present study investigates all the most important and fundamental concepts that are central to Avicenna's natural philosophy with an eye both to significant developments in the preceding Greek and Arabic traditions, and to parallel or supplementary materials from his other major works, in order to examine thoroughly and accurately Avicenna's position within the history of natural philosophy by providing a comprehensive understanding of the key concepts, i.e., elements, of Avicenna's physics.

10 Some of these aspects have been treated in publications or monograph-length studies by Bertolacci, Richardson, and especially Wisnovsky; cf. Wisnovsky, *Avicenna on Final Causality*; “Final and Efficient Causality in Avicenna's Cosmology and Theology”; “Towards a History of Avicenna's Distinction between Immanent and Transcendent Causes”; Bertolacci, “The Doctrine of Material and Formal Causality”; Richardson, “Avicenna's Conception of the Efficient Cause.”

11 This study also does not discuss Avicenna's account of chance and luck in *al-Samā' al-ṭabī'ī* I.13–14. For Avicenna, chance and luck are merely accidental causes. This means that, in the final analysis, they have no bearing on the natural world, because a more proper investigation of why a certain effect has come about will eventually reveal its essential causes – and it is these essential causes which are relevant for the science of nature. Moreover, Belo has already provided an investigation of Avicenna's views on chance and luck in her book *Chance and Determinism in Avicenna and Averroes*.

12 cf. McGinnis, “Avicennan Infinity.”

I regret that I could include an investigation of Avicenna's engagement with Mu'tazilī and early Aš'arī theology only occasionally.¹³ Likewise, close to no mention is made of later Andalusian figures such as Abū Bakr Muḥammad ibn Bāğğa, Abū Bakr Muḥammad ibn Ṭufayl, and Averroes, whose works may contain further material on the development of natural philosophy from Antiquity to Avicenna.¹⁴ Perhaps most regrettably, the materials contained in Averroes' commentaries on Aristotle's *Physics* could also not be taken into consideration. Moreover, I could not take into account the Latin tradition of reading both Avicenna's *al-Samā' al-ṭabī'ī* and Aristotle's *Physics* or of Averroes' commentary on the latter.¹⁵ Finally, the later Islamic tradition of philosophy and kalām in reaction to Avicenna's philosophical system has almost entirely been neglected in this study; yet, the rich materials of the post-Avicennian tradition have already riveted my attention within the research project "The Heirs of Avicenna: Philosophy in the Islamic East from the Twelfth to the Thirteenth Century."¹⁶

Structure and Prospect

The first chapter of this study is concerned with providing an account of the transmission of Aristotle's text of the *Physics* and its Greek commentaries into Arabic, and additionally also surveys a number of other sources which were significant in the history of natural philosophy up to Avicenna. Most of the texts mentioned in this first chapter will reappear, often prominently, in the remainder of this study and illuminate either how Avicenna himself conceived of certain concepts or how certain figures in the preceding history did to whose conception, then, Avicenna reacted. While Avicenna's *al-Samā' al-ṭabī'ī* is at the heart of this study, this first chapter seeks to describe the wide range of texts which form its basis.

The second chapter is concerned with Avicenna's methodology in his writings on natural philosophy. It expounds how Avicenna conceives of his own philosophy in most of his major works and especially in his *al-Šifā'*. The general picture drawn out in this chapter is not entirely new and has, in other publications, either implicitly assumed or explicitly addressed.¹⁷ Yet, it has not been canvassed from the specific viewpoint of natural philosophy for which it is, in fact, of utmost importance, not least because in his major works, Avicenna usually comments on his methodology precisely at the beginning of the sections on natural philosophy.

¹³ A full investigation of this interesting facet is yet to be carried out.

¹⁴ cf. Lettinck, *Aristotle's Physics and its Reception in the Arabic World*; Belo, *Chance and Determinism in Avicenna and Averroes*; Glasner, *Averroes' Physics*; Cerami, *Génération et substance*.

¹⁵ cf. esp. Trifogli, *Oxford Physics in the Thirteenth Century*.

¹⁶ This project started in the Spring of 2016; it is directed by Peter Adamson and funded by the German Research Foundation (DFG).

¹⁷ cf. esp. Bertolacci, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb al-Šifā'*, ch. 6.

The exposition of Avicenna's views on the principles of natural things, which is carried out in the third chapter, may be the most "metaphysical" topic of this study. Incidentally, this is the reason why in this chapter, more than in the others, I shall engage with the interpretations and views expressed by various authors in the secondary literature, for there simply exist more scholarly contributions on Avicenna's views on matter, form, and corporeality than on other aspects that are immediately relevant for his natural philosophy. However, this does not also entail that the scientific community has already formed a correct understanding of Avicenna's account. To the contrary, it will be shown that the interpretations that have been presented so far in the secondary literature are, more often than not, inaccurate, as they misrepresent Avicenna's intentions and testify to a misunderstanding of his words.

Avicenna's account of nature as a principle of motion within natural things is an apparent case for Avicenna's engagement with earlier opinions or, more precisely, with one particularly influential earlier opinion. That this earlier opinion has its roots in late-ancient developments in reading Aristotle's *Physics* was to be expected; that it must also be understood in light of the writings of Avicenna's immediate contemporaries, and that Avicenna is effectively reacting to an entire, and hitherto unnoticed, tradition of, as he would say, misunderstanding the power of nature, is the central theme of the fourth chapter.¹⁸

Regarding the philosophical understanding of place, Avicenna finds himself in a difficult situation. Rigorously accepting Aristotle's definition with all its consequences, he has to face the opposition of virtually the entire preceding Greek philosophical tradition which, as is well-known, had turned against Aristotle. As is shown in the fifth chapter, Avicenna was probably the first in the history of philosophy systematically to defend, and successfully to restore, what for centuries had been ridiculed as an implausible, even crazy, understanding of the reality of place. In addition to the materials drawn from the Greek tradition, Avicenna is also reacting to certain trends and tendencies of his own time, most notably the views about space and void expressed by the members of the Baṣrian strand of Mu'tazilism.

Time is arguably the most complex notion discussed in Avicenna's *al-Samā' al-ṭabī'ī* – more complex than the others and also more complex than previous studies have so far noticed. According to the commonly accepted interpretation, Avicenna was influenced by ancient and late ancient readings of Aristotle which described time in terms of a flowing now which generates time much like the tip of a ballpoint pen could be seen as producing a line through its motion on a sheet of paper. It will be shown in chapter six that this understanding of Avicenna's account of time is inadequate. For one thing, Avicenna rejected the idea of a flowing now as the cause of time's existence. More importantly, however, the now is also not relevant for his understanding of time's

¹⁸ I have recently published some materials from this fourth chapter in an article with the title "Defining Nature."

essence. The complexity of Avicenna's account of time as the magnitude of motion and the universal source of beforeness and afterness within the world can only be unravelled if his account is read against the background of a common Peripatetic confusion about the relation between motion and time, on the one hand, and a well-known attack that charges the Aristotelian definition with circularity, on the other. It is the traces of this confusion in Avicenna, together with his defence against this charge, which is ultimately responsible for the increasing complexity of his account, as he struggled to – unwittingly – combine seemingly incompatible Neoplatonic and Peripatetic elements within a single coherent and more robust theory.

Taking it all together, this study shows that Avicenna's analysis of the central concepts and the core issues of natural philosophy is innovative and resourceful in the highest degree. His discussions are rich, his material is vast, his positions are intriguing, and his stance is both rigorously Peripatetic and characteristically Avicennian. Although on a large scale, the structure of his *al-Samā' al-ṭabī'ī*, and in particular of its first two books, may appear to follow closely the order of exposition in Aristotle's *Physics*, a more detailed analysis reveals that Avicenna's independence in execution, his resolution in argument, and his innovative power in discussion are tremendous and unmistakable – just as one, given the fruitful research on his logic and metaphysics, should have expected.

1 The Arabic Fate of Aristotle's *Physics*

In this chapter, I survey the transmission of Aristotle's *Physics* into Arabic, in order to set the basis for my subsequent investigation of the central concepts of Avicenna's physics. Since Avicenna formed his philosophy by engaging with the materials from the preceding Greek and Arabic traditions, it is important to bring to mind which texts were available to him and what he might have known, used, and reacted to. Accordingly, the contents of this chapter not only indicate the wide range of texts that need to be taken into consideration if the assessment of Avicenna's natural philosophy is to be adequate, they also provide information on translators and translations that will be presupposed and referred to in the remainder of this study.

Much information here derives from the famous *Kitāb al-Fihrist*, an annotated bio-bibliographical catalogue composed by the Baḡdādī book merchant Abū l-Faraḡ Muḥammad ibn Ishāq al-Nadīm (d. ~ 385/995). This catalogue contains primarily two passages which report on translations of Aristotle's *Physics* that either were available to Ibn al-Nadīm, had been in his possession, or were simply known by him.¹ Many sections of the *Kitāb al-Fihrist*, including one on Aristotle's *Physics*, have been copied verbatim by the historian 'Alī ibn Yūsuf ibn al-Qiftī (d. 646/1248) into his own *Ta'riḥ al-ḥukamā'*, often furnished with additional information.²

Ibn al-Nadīm's catalogue has received a large share of attention among scholars. With regard to its information on the Arabic transmission of the *Physics*, particular mention is to be made of Moritz Steinschneider's well-known study *Die arabischen Übersetzungen aus dem Griechischen* and Francis Peters' partial translation and study *Aristoteles Arabus*.³ Elias Giannakis' unpublished doctoral dissertation on *Philoponus in the Arabic Tradition of Aristotle's Physics* as well as a number of subsequently published articles provide valuable information on the context of reading Aristotle's *Physics* in fourth/tenth-century Baḡdād.⁴ Moreover, important information concerning the Graeco-Arabic translation movement, in particular regarding its influence on Avicenna's philosophy, can be gathered from Amos Bertolacci's assessment of the sources for Avicenna's *al-Ilāhiyyāt* as well as from Dimitri Gutas' analysis of the philosophical curriculum outlined in the *Kitāb fī aṣnāf al-'ulūm al-ḥikmiyya* of Abū Sahl al-Masiḥī (d. 401/1010).⁵

1 Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 244.5f., 250.7–27 (ed. Flügel)/vol. 2, 145.5f., 166.1–167.12 (ed. Sayyid).

2 cf. Ibn al-Qiftī, *Ta'riḥ al-ḥukamā'*, 38.9–39.21; cf. also Ḥāḡḡī Ḥalīfa, *Kaṣf al-zunūn*, §§7258, 10190, 10193.

3 cf. esp. Steinschneider, *Die arabischen Übersetzungen aus dem Griechischen*, 50–55; Peters, *Aristoteles Arabus*, 30–34.

4 cf. esp. Giannakis, "The Structure of Abū l-Ḥusayn al-Baṣrī's Copy of Aristotle's *Physics*"; "Fragments from Alexander's Lost Commentary on Aristotle's *Physics*."

5 cf. Bertolacci, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb al-Šifā'*, ch. 11; Gutas, *Avicenna and the Aristotelian Tradition*, 169–179.

1.1 Transmission and Translation

The transmission of Aristotle's *Physics* into Arabic is intimately related to the transmission of the Greek commentaries on the *Physics*, especially those written by Alexander of Aphrodisias (fl. ~ 200) and John Philoponus (d. 574).⁶ As it turns out, this circumstance is to the detriment of anyone hoping to acquire an *exact* understanding of the scope and nature of the Arabic translations of the *Physics*, as the information we can gather from our bibliographical sources concerns more the commentaries than the text commented upon. Of course, the Greek commentaries as we know them are, for the most part, lemmatised expositions, i.e., commentaries which, first, quote some lines from the Aristotelian text and, then, engage in a more or less free analysis of the quoted passage before turning to the next few lines from the text. Lemmatised commentaries, thus, provide in and of themselves a relatively complete version of the Aristotelian text.⁷ Yet, it is also clear that any information on the Graeco-Arabic translations of *commentaries* does not as such tell us anything exact about whether, and to what extent, an Arabic version of Aristotle's *text* itself existed, circulated, and was used at a certain time in an intellectual milieu, or whether an interested reader had to turn to an Arabic version of (some parts of) a commentary and from there come to know (some parts of) the Aristotelian text. This is particularly problematic, when – as in the case of Aristotle's *Physics* – the bibliographical sources allow for different interpretations.

Translations Mostly “with” the Commentaries of Alexander and Philoponus

The earliest attested translation of Aristotle's *Physics* is that by Sallām al-Abrāš (fl. mid second/late eighth century), who worked under the reign of Hārūn al-Rašīd (d. 193/809; r. 169/786–193/809), the fifth ‘Abbāsīd caliph at Baġdād.⁸ According to Peters, Ibn al-Nadīm did not specify the language into which Sallām al-Abrāš translated the *Physics*, suspecting that the translation “may have provided the Syriac *Vorlage* for Ibn Na‘imah's

⁶ For the Greco-Arabic translation movement, cf. esp. Endreß, “Die wissenschaftliche Literatur”; Gutas, *Greek Thought, Arabic Culture*; “Greek Philosophical Works Translated into Arabic.”

⁷ It is worth noting that the lemmata of a commentary follow a different line of transmission than both the running text of the commentary itself and the passages quoted or paraphrased within the running text of the commentary; cf. Primavesi's remarks in Aristotle, *Metaphysics A*, 407f. as well as Barnes, “An Introduction to Aspasius,” 37. For a more positive evaluation, in particular regarding the lemmata in Alexander's commentary on the *Metaphysics*, cf. Kotwick, *Alexander of Aphrodisias and the Text of Aristotle's Metaphysics*, esp. 38–50.

⁸ cf. Endreß, “Die wissenschaftliche Literatur,” 422; Gutas, *Greek Thought, Arabic Culture*, 72f.; D'Ancona, “Greek Sources in Arabic and Islamic Philosophy,” ch. 2. In Sayyid's recent edition of Ibn al-Nadīm's *Kitāb al-Fihrist*, vol. 2, 145.5, “Salām [sic] and al-Abrša [sic]” appear to be two translators. The textual variant *Sallām wa-l-Abrāš*, however, is also noted by Endreß, “Die wissenschaftliche Literatur,” fn. 38, 422.

Arabic” version, subsequently produced in the early third/early ninth century.⁹ Apparently, Peters overlooked that in the heading of the section that mentions Sallām al-Abraš as a translator of the *Physics*, Ibn al-Nadīm informs us of his intention to list the names of translators who translated “into the Arabic language” (*ilā l-lisān al-‘arabī*).¹⁰ We should, therefore, assume that the target language of Sallām al-Abraš’s efforts was Arabic. Perhaps we may even surmise, despite the lack of any further information, that his translation covered the whole of Aristotle’s *Physics*.¹¹

Later, Ibn al-Nadīm reports that a translation of Aristotle’s *Physics* “with the commentary” (*bi-tafsīr*) of Porphyry (d. ~ 305) on books I–IV was extant. As the translator, he names a certain Basīl (fl. early third/early ninth century), whose son Iṣṭifān ibn Basīl was a translator of medical texts in the circle of Ḥunayn ibn Iṣḥāq (d. 260/873) and arguably the brother of Taḏārī ibn Basīl, the translator of the extant Arabic version of Aristotle’s *Prior Analytics*.¹² Not much is known of Basīl’s translation or even of Porphyry’s commentary.¹³ Ibn al-Nadīm mentions Basīl’s translation of Porphyry’s commentary in a general section which lists “the *Physics* with various commentaries of numerous philosophers” (*bi-tafāsīr ḡamā‘at falāsifa mutafarriqīn*). The expression *bi-tafsīr* (pl. *bi-tafāsīr*) is sufficiently ambiguous to conceal whether Basīl translated Aristotle’s *Physics* in full (and then continued with a translation of books I–IV of Porphyry’s commentary) or whether he translated only the first four books of Porphyry’s commentary (which contained at least parts of the Aristotelian text of the first four books in the form of lemmata). We also have no information about whether his translation was made on the basis of the Greek text or an earlier Syriac version.

In the same section on “the *Physics* with various commentaries of numerous philosophers,” Ibn al-Nadīm also mentions Ibrāhīm ibn al-Ṣalt (fl. third/ninth century) as the translator of book one of “this book” (*hādā l-kitāb*).¹⁴ Just as before in that section, the expression “this book” may seem to refer to Aristotle’s *Physics*, mentioned in the section heading. Yet, the question arises why his translation is mentioned in a section

⁹ Peters, *Aristoteles Arabus*, 32.

¹⁰ Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 244.1 (ed. Flügel)/vol. 2, 144.2 (ed. Sayyid).

¹¹ Gutas mentions that Sallām al-Abraš’s translation may have been used by the second/eighth century theologian Hišām ibn al-Ḥakam in his attack on the concept of God developed in the eighth and last book of the *Physics* (*Greek Thought, Arabic Culture*, 73).

¹² cf. Lameer, *al-Fārābī and Aristotelian Syllogistics*, 3f. Steinschneider refers to some variant readings in the apparatus of Flügel’s edition of the *Kitāb al-Fihrist* and considers the possibility that not Basīl but one of his sons translated Porphyry’s commentary; cf. *Die arabischen Übersetzungen aus dem Griechischen*, 51f., referring to Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 2, 115.

¹³ Apart from the fragments collected by Romano (*Porfirio e la fisica aristotelica*) and by Smith (Porphyry, *Fragmenta*), the Greek original of Porphyry’s commentary is not known to be extant. A potential fragment of the Arabic translation is found in Abū Bakr al-Rāzī, *Maqāla fī-mā ba‘d al-ṭabī‘a*, 120.19–121.19, and has been included as frgm. 463F in Smith’s collection; cf. also Adamson, “*Porphyrius Arabus* on Nature and Art,” discussing the fragment and its context.

¹⁴ Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 250.25 (ed. Flügel)/vol. 2, 167.10 (ed. Sayyid).

that reports on “the *Physics* with various commentaries,” even though it is precisely a translation of the *Physics* without a commentary. Alternatively, then, “this book” could refer to whatever book was mentioned immediately before the information on Ibn al-Šalt’s efforts, and this was a commentary on parts of the first book of the *Physics* composed by Tābit ibn Qurra (d. 288/901). Now, the mother tongue of Tābit ibn Qurra was Syriac, so it is possible that he composed a Syriac commentary on parts of the first book of Aristotle’s *Physics*, which was, then, translated into Arabic by Ibn al-Šalt. Here, however, it is problematic that Tābit ibn Qurra could just as well also have written his commentary in Arabic (in fact, we might even expect that he did); that Ibn al-Nadīm used the expression “this book” before, albeit in order to refer to the *Physics*; and that Tābit ibn Qurra’s commentary covered only *part* of the first book of Aristotle’s *Physics*, whereas Ibn al-Šalt’s translation was of “the first book,” i.e., *the whole* of the first book.

The next translation that is known is the one produced by ‘Abd al-Masiḥ ibn Nā‘ima al-Ḥimṣī (fl. ~ 215/830), who was already mentioned above in a quote from Peters’ study. He was active in the circle of Abū Ya‘qūb ibn Ishāq al-Kindī (d. ~ 256/870) and is known for his involvement in the production of the Arabic *Theology of Aristotle* and the Arabic (or rather Syriac?) translation of *De sophisticis elenchis*.¹⁵ Regarding the *Physics*, Ibn al-Nadīm attributes to Ibn Nā‘ima a translation of Aristotle’s work “with the commentary of John Philoponus” (*bi-tafsīr Yaḥyā al-Naḥwī*) on books V–VIII. Again, the expression *bi-tafsīr* does not make clear whether Ibn Nā‘ima produced a translation of Aristotle’s entire *Physics* (to which he, then, added a translation of books V–VIII of Philoponus’ commentary) or whether he simply translated the last four books of Philoponus’ commentary (together with whatever these four books contained of the Aristotelian text in the form of lemmata). We likewise do not know whether Ibn Nā‘ima translated from the Greek text or, as may seem more likely, from an earlier Syriac version, as Peters also suggested.

What we do know, however, is that before the Arabic tradition came to refer to Aristotle’s *Physics* with the title *al-Samā‘ al-ṭabī‘ī*, it was known as *Kitāb al-Kiyān* or *Sam‘ al-kiyān*, even though it is uncertain whether this title ought to be associated primarily with Sallām al-Abraš’s translation of Aristotle, or with Basīl’s or Ibn Nā‘ima’s partial translation of one of the two commentaries, or even with whatever it was Ibn al-Šalt translated. The title *Sam‘ al-kiyān* stems from the Syriac expression *Šem‘ā kyānāyā*, which is a perfectly literal rendering of the Greek title traditionally given to Aristotle’s *Physics*, viz., *Φυσικὴ ἀκρόασις*.¹⁶ If neither Basīl’s nor Ibn Nā‘ima’s translation provided the full text of Aristotle’s *Physics*, covering it only partially, i.e., to the extent it was contained in the lemmata of those parts of Porphyry’s and Philoponus’ commentaries

¹⁵ cf. Zimmermann, “The Origins of the So-Called *Theology of Aristotle*”; Adamson, *The Arabic Plotinus*. As I have been informed by Pieter Sjoerd Hasper and Gerhard Endreß, the involvement of Ibn Nā‘ima in the translation of *De sophisticis elenchis* is uncertain.

¹⁶ cf. esp. Arzhanov and Arnzen, “Die Glossen in Ms. *Leyden* or. 583,” 425–429; cf. also Kraus, “Zu Ibn al-Muqaffa’,” fn. 2, 7f.; Hein, *Definition und Einteilung der Philosophie*, 288, 407f.

which they translated, and if Ibn al-Šalt's translation was incomplete at any rate, then we may perhaps hesitate to assume that the title *Sam' al-kiyān* was meant to refer to any of these incomplete versions and, instead, surmise that the older and complete translation of Sallām al-Abraš already circulated under this title.¹⁷ However, the alternative assumption that there may have existed a full translation of Aristotle's *Physics* by Ibn Nā'ima, i.e., one which additionally included the second half of Philoponus' commentary, might find some support in the information which Ibn al-Nadīm provides about al-Kindī, who reportedly composed a treatise *Fī sam' al-kiyān*.¹⁸ Since Ibn Nā'ima was an active member of al-Kindī's circle, it may well have been his translation of Aristotle which al-Kindī read before he composed his own treatise. This, in turn, would indicate that al-Kindī either had no access to Sallām al-Abraš's earlier translation or that he considered it to be of such poor quality, that he requested from Ibn Nā'ima a new full translation of the *Physics* (including the second half of Philoponus' commentary).¹⁹ It may, however, also simply mean that al-Kindī, having access the Sallām

¹⁷ Two minor caveats should be mentioned here. In his *Kitāb al-Fihrist*, Ibn al-Nadīm provides three pieces of information about Sallām al-Abraš: that he was one of the “old translators” (*min al-naqala al-qudamā*), that he was active “during the days of the Barmakids” (*min ayyām al-barāmika*), and that “the *Physics* exists in his translation” (*wa-yūḡadu bi-naqlihi al-Samā' al-ṭabī'i*; vol. 1, 244.5f. (ed. Flügel)/vol. 2, 145.5f. (ed. Sayyid)). The first of these minor caveats, then, is that the last piece of information here could be taken to mean that Sallām al-Abraš's translation was precisely not called *Sam' al-kiyān* but already carried the title *al-Samā' al-ṭabī'i*, the same title by which Aristotle's work will later commonly be known. It should be clear, though, that far from stating that Sallām al-Abraš's translation was called *al-Samā' al-ṭabī'i*, Ibn al-Nadīm merely mentions that Sallām al-Abraš translated *inter alia* that work which he, i.e., Ibn al-Nadīm in Bagdād in the fourth/tenth century, calls *al-Samā' al-ṭabī'i* – and we do know from other sections in his *Kitāb al-Fihrist* that this is, indeed, how Ibn al-Nadīm refers to Aristotle's *Physics*. The second caveat is that according to Kraemer, Sallām al-Abraš translated the *Physics* “from Persian into Arabic” (*Humanism in the Renaissance of Islam*, 134). If true, this could undermine the present suggestion that it may have been Sallām al-Abraš's translation that was referred to as *Sam' al-kiyān* – a title indicating a Syriac (and not a Persian) intermediary in the line of transmission. Neither of the two references which Kraemer provides, however, mentions a Persian intermediary for Sallām al-Abraš's translation. It may perhaps be that Kraemer silently identified Sallām al-Abraš with another person by the name of Salm, whom Ibn al-Nadīm elsewhere reports to have translated “from Persian into Arabic” (*min al-fārisī ilā l-'arabī*; *Kitāb al-Fihrist*, vol. 1, 120.16f. (ed. Flügel)/vol. 1, 374.9–11 (ed. Sayyid)). However, as Endreß already noted, Salm and Sallām al-Abraš were probably two different translators; cf. “Die wissenschaftliche Literatur,” 422; cf. also Peters, *Aristoteles Arabus*, 11. Moreover, Ibn al-Nadīm's description of Sallām al-Abraš specifically as having been active “during the days of the Barmakids” seems to serve the exclusive purpose of a temporal designation, stressing the point that Sallām al-Abraš really was one of the “old translators,” so that he was active during the reign of caliph Hārūn al-Rašīd, but not that he translated from Persian; cf. also Gutas, *Greek Thought, Arabic Culture*, 72.

¹⁸ *Kitāb al-Fihrist*, vol. 1, 256.16 (ed. Flügel)/vol. 2, 185.8 (ed. Sayyid). Surprisingly, Ibn al-Nadīm lists this treatise as one of al-Kindī's “logical works” (*kutubuhū l-mantiqiyya*).

¹⁹ According to Kraus, it was, indeed, Ibn Nā'ima's translation that was known as *Sam' al-kiyān*; cf. Kraus, “Zu Ibn al-Muqaffa’,” fn. 2, 7f. His argument, however, does not rule out that the title was already in use before and merely confirms that Ibn Nā'ima's translation was made from a Syriac intermediary.

al-Abraš's translation, requested a translation only of the important second half of Philoponus' commentary. Additionally, it may also well be that Ibn Nā'ima's translation of Philoponus' commentary on books V–VIII was meant to complement Basil's translation of Porphyry's commentary on books I–IV. Although this remains a purely speculative hypothesis, it could at least explain the otherwise puzzling fact that Ibn Nā'ima apparently began his translation efforts with the fifth book, i.e., in the middle of the work.²⁰

What seems to be the most convincing interpretation of the evidence so far is to assume that Sallām al-Abraš translated the *Physics* in full, that his translation was known as Aristotle's *Sam' al-kiyān*, and that Basil's and Ibn Nā'ima's new translations of the first and the second half of the *Physics* together "with the [partial] commentaries" of Porphyry and Philoponus, may have circulated under the same already known title, before it became customary to refer to Aristotle's *Physics* as *al-Samā' al-ṭabī'ī* instead.²¹

²⁰ That Basil apparently stopped his translation efforts likewise in the middle of the work after the fourth book is less puzzling and, in fact, corresponds to Romano's claim that Porphyry properly commented only on books I–IV, to which he added a mere compendium on book V, altogether neglecting the remaining books VI–VIII; cf. Romano, *Porfirio e la fisica aristotelica*, esp. 54–56. Romano's assertion is accepted by Urmson in fn. 3, 124, to his translation of Simplicius' commentary on the fifth book of the *Physics*; cf. also Moraux, "Porphyre, commentateur de la *Physique* d'Aristote"; Adamson, "Porphyrius Arabus on Nature and Art"; A. Smith, "The Significance of 'Physics' in Porphyry."

²¹ The title *al-ḥabar al-ṭabī'ī* is also attested in the third/ninth century as referring to Aristotle's *Physics*, for example, by al-Kindī in his *Risāla fī kammiyyat kutub Aristūṭālīs wa-mā yuḥtāḡu ilayhi fī taḥṣīl al-falsafa*, vol. 1, 382.14f.; cf. also Arzhanov and Arnzen, "Die Glossen in Ms. Leyden or. 583," 426. Philosophers who used the title *Sam' al-kiyān* in their Arabic works include, apart from al-Kindī, the Ps.-Aristotle who composed the *Kitāb al-Ḥaraka*, Abū Bakr Muḥammad ibn Zakariyā' al-Rāzī, the Iḥwān al-Ṣafā', Abū Naṣr al-Fārābī, and Avicenna. In the *Kitāb al-Ḥaraka*, the title is mentioned three times (cf. the searchable online version of the *Kitāb al-Ḥaraka* and the excerpt (containing only two occurrences) in Wakelnig, *A Philosophy Reader from the Circle of Miskawayh*, appx. 2, 486.4, 12); Abū Bakr al-Rāzī uses it in his *Maqāla fī-mā ba'd al-ṭabī'a*, 121.6, and his *Kitāb al-Sira al-falsafiyya*, 109.1f.; the Iḥwān al-Ṣafā' refer with it to their epistle on physics in *Rasā'il Iḥwān al-Ṣafā'* XVI.1, 679; al-Fārābī uses it in his *Risāla fī-mā yanbaḡi an yuqaddama qabla ta'allum al-falsafa*, 51.2; the expression *ṣinā'at al-kiyān* occurs in al-Fārābī (?), *Kitāb al-Ḡam' bayna ra'yay al-ḥakīmayn Aflāṭun al-ilāhī wa-Aristūṭālīs*, 45.12; Avicenna uses *Kitāb al-Kiyān* in his *Risāla fī aqsām al-'ulūm al-'aqliyya*, 108.17, and *Sam' al-kiyān* in his correspondence with Abū Rayḥān al-Bīrūnī, known as *al-As'ila wa-l-aḡwiba*, 18.7, 23.13; finally, Avicenna's disciple Abū Sa'id Aḥmad ibn 'Alī al-Ma'sūmī also uses *Sam' al-kiyān* in his reply – on behalf of Avicenna – to al-Bīrūnī's response (68.10). Moreover, Gutas notes that at least in some (early?) recensions of Avicenna's *Risāla fī l-aḡrām al-'ulwiyya*, the term *kiyān* is found to designate the concept of nature; cf. Gutas, "The Study of Avicenna," 61. Even after Avicenna, the term was in use, as is evinced by the brief preface to the final four chapters from the area of natural philosophy in Abū Ḥamid al-Ġazālī's *Tahāfut al-falāsifa*, 268.9. Whether or not this indicates that al-Ġazālī, in composing this preface, relied upon Avicenna's *Risāla fī aqsām al-'ulūm al-'aqliyya* remains to be seen. At any rate, Avicenna's and al-Ġazālī's enumerations of the natural sciences share many conspicuous similarities. On Avicenna's treatise, cf. also Michot's annotated translation published as Avicenna, *Les sciences physiques et métaphysiques selon la Risālah fī Aqsām al-'ulūm d'Avicenne*.

Ibn al-Nadīm attributes, in the same ambiguous way, a translation of Aristotle’s work “with the commentary” (*bi-tafsīr*) of Philoponus’ on books I–IV to the translator Qusṭā ibn Lūqā al-Ba’labakkī (d. 300/912). The natural assumption would be that Qusṭā’s translation of the first and Ibn Nā’ima’s translation of the second half of Philoponus’ commentary were meant to complement each other. In addition to that, Qusṭā is also said to have translated Aristotle’s work “with the commentary” (*bi-tafsīr*) of Alexander on books IV, V, and VII. Once more, we do not know whether we should understand Ibn al-Nadīm’s expression *bi-tafsīr* in such a way that Qusṭā produced a complete Arabic version of Aristotle’s *Physics* together with one half of Philoponus’ and (at least) one third of Alexander’s commentary or whether Qusṭā only translated parts of these two commentaries together with the Aristotelian text inasmuch as it was contained in their lemmata. Since it is unlikely that Qusṭā translated the complete text of Aristotle’s *Physics* twice, i.e., once together with parts of Philoponus’ commentary and once together with parts of Alexander’s commentary, we might have to understand *bi-tafsīr* generally as indicating that Aristotle’s text was translated only insofar as it was contained in the lemmata of the commentaries. This would further mean that Basīl’s and Ibn Nā’ima’s translations were just as incomplete as Qusṭā’s, and suggest that the title *Sam’ al-kiyān* originally, indeed, referred to the translation by Sallām al-Abraš, which is the only complete – and incidentally also the oldest – translation so far mentioned. Moreover, in light of its title, Sallām al-Abraš may have produced his translation on the basis of an earlier Syriac version. Additionally, it is also possible that Qusṭā’s translation was also complete in the sense that he translated the first half of the *Physics* “with the commentary” of Philoponus and the second half “with the commentary” of Alexander, which, then, would indicate that Qusṭā is also the translator of books VI and VIII of Aristotle “with” Alexander, i.e., those books that are mentioned by Ibn al-Nadīm without being linked to the name of a translator.

What is more, Ibn al-Nadīm also credits Abū ‘Uṭmān al-Dimašqī (fl. late third/early tenth century) with an extant version of Alexander’s commentary on *Physics* IV. While this could mean that al-Dimašqī was yet another translator who produced an Arabic version of Aristotle’s *Physics* together with parts of Alexander’s commentary, it is more plausible to assume, again, that the expression *bi-tafsīr* indicates merely that parts of Alexander’s commentary were translated together with the Aristotelian text contained therein or, as a third alternative in this case, that al-Dimašqī’s contribution was overall limited to revising some of the work of his older contemporary Qusṭā, so that it was *his* revision that was reportedly more widely distributed (*al-zāhir al-mawḡūd*) at the time of Ibn al-Nadīm.²²

²² In any case, Giannakis notes that al-Dimašqī “is known to have taken a special interest in Alexander” (*Philoponus in the Arabic Tradition of Aristotle’s Physics*, 90; “Fragments from Alexander’s Lost Commentary on Aristotle’s *Physics*,” 157); cf. also Arzhanov and Arnzen, “Die Glossen in Ms. *Leyden* or. 583,” 462. It should further be noted that al-Dimašqī is explicitly mentioned as the translator of

Concerning Alexander's commentary, there is also Yaḥyā ibn 'Adī (d. 363/974), who is credited with having revised an Arabic translation by Abū Rawḥ al-Ṣābi' (fl. late third/early tenth century) of book I of Aristotle's *Physics* "with the commentary" (*bi-tafsīr*) of Alexander and said to have translated book II, again "with the commentary" (*bi-tafsīr*) of Alexander, on the basis of an earlier Syriac version by Ḥunayn ibn Isḥāq.²³ The third book of Aristotle's *Physics* "with the commentary" (*bi-tafsīr*) of Alexander was, according to Ibn al-Nadīm, not extant.

Tab. 1.1: Arabic Translations of Aristotle's *Physics* with and without commentaries.

		<i>Physics</i>							
		I	II	III	IV	V	VI	VII	VIII
Sallām al-Abraš:	Aristotle	x	x	x	x	x	x	x	x
Ibrāhīm ibn al-Ṣalt:	Aristotle?	x							
Basīl:	Porphyry	x	x	x	x				
Ibn Nā'ima:	Philoponus					x	x	x	x
Qusṭā ibn Lūqā:	Philoponus	x	x	x	x				
Qusṭā ibn Lūqā:	Alexander				x	x	?	x	?
al-Dimašqī:	Alexander				x				
Abū Rawḥ al-Ṣābi':	Alexander	x							
Yaḥyā ibn 'Adī:	Alexander	x	x						
Isḥāq ibn Ḥunayn:	Aristotle	x	x	x	x	x	x	x	x

At best, this information attests to four complete translations of Aristotle ("with" different parts of various commentaries), viz., those by Sallām al-Abraš, Basīl, Ibn Nā'ima, and Qusṭā (or five, should we consider Qusṭā to have translated it twice, once with Alexander's and once with Philoponus' commentary; or even eight, if we wanted to include the efforts of Ibn al-Ṣalt, al-Dimašqī, and Ibn 'Adī with the help of al-Ṣābi' as well). At worst, we have to be content with only one complete translation – that by Sallām al-Abraš – together with several parts from Alexander's, Porphyry's, and Philoponus' commentaries, sometimes in multiple translation, which may or may not

the *Risālat al-Iskandar al-Afrūdīsī fī anna kull mā yataḥarraku fa-innamā yataḥarraku 'an muḥarrik*, which is jointly preserved through Ms. Carullah 1279 at Süleymaniye Kütüphanesi in Istanbul and Ms. arab. 794 at Real Biblioteca del Monasterio de San Lorenzo in El Escorial. Now, according to a suggestion by Pines, this work may not be one of Alexander's independent treatises against Galen but an "extract from Alexander's lost *Commentary* on Aristotle's *Physics*" ("Omne quod movetur necesse est ab aliquo moveri," 22). Pines' suggestion was critically discussed, and ultimately rejected, by Rescher and Marmura in their edition of the treatise (esp. 60–62). Following Rescher's and Marmura's criticism, I do not consider the Arabic version of Alexander's treatise as evidence indicating that al-Dimašqī translated (or revised) not only the fourth but also (parts of) the seventh book of Aristotle's *Physics* "with the commentary" (*bi-tafsīr*) of Alexander into Arabic.

²³ According to Ḥaḡḡī Ḥalīfa, it was the third book, and not the second; cf. *Kaṣf al-ẓunūn*, vol. 3, 619.7.

have contained lemmatised quotations of the Aristotelian text.²⁴ In that case, however, we might cherish the prospect that Basīl's and Ibn Nā'ima's combined activities as well as Qusṭā's double effort, if accumulated, may have amounted to a second and even a third full translation of the *Physics*.

All this remains speculation, because none of these translations has survived in any substantial form.

Ms. Leiden or. 583

Finally, there is the Arabic translation by Ishāq ibn Ḥunayn (d. 298/910–11), which, as far as I can see, is not mentioned in either Ibn al-Nadīm's *Kitāb al-Fihrist* or Ibn al-Qifṭī's *Ta'riḥ al-ḥukamā'*. It is the only Arabic translation of Aristotle's *Physics* that is known to be extant today. Ishāq ibn Ḥunayn produced it presumably on the basis of an earlier Syriac version of his own or his father Ḥunayn ibn Ishāq.²⁵ His Arabic translation survives in the manuscript or. 583 from the collection which Levinus Warner (d. 1665) bequeathed to the University of Leiden.²⁶ The manuscript contains 233 folia and was transcribed in 524/1129–30 by the physician and poet Abū l-Ḥakam al-Mağribī (d. 549/1155) from a copy of an earlier annotated exemplar of Ishāq ibn Ḥunayn's translation.²⁷ This earlier exemplar was prepared by the Mu'tazili theologian Abū l-Ḥusayn al-Baṣrī (d. 436/1044) around the year 395/1004 and copied by an anonymous scribe in 470/1077, this latter being the copy from which Abū l-Ḥakam al-Mağribī transcribed the manuscript which we today know as Ms. Leiden or. 583.²⁸

The original exemplar of Abū l-Ḥusayn was the result of his own studies in philosophy within the school of the so-called Baḡdād Peripatetics under Abū 'Alī ibn al-Samḥ (d. 418/1027) and Abū l-Faraḡ 'Abd Allāh ibn al-Ṭayyib (d. 435/1043).²⁹ Ibn al-Samḥ was a pupil of Ibn 'Adī, whereas Ibn al-Ṭayyib was taught by Ibn 'Adī's students, among

²⁴ In this regard, one should mention Endreß' general warning that it is not certain whether the translator of a commentary would also have translated the text that was commented upon; cf. "Die griechisch-arabischen Übersetzungen und die Sprache der arabischen Wissenschaften," 108.

²⁵ cf. Peters, *Aristoteles Arabus*, 32; Arzhanov and Arnzen, "Die Glossen in Ms. *Leyden or. 583*," 439–442.

²⁶ For information on the manuscript, cf. Peters, *Aristoteles Arabus*, 31f.; Witkam, *Seven specimens of Arabic Manuscripts*, 14f.; Kraemer, *Humanism in the Renaissance of Islam*, 109; Giannakis, *Philoponus in the Arabic Tradition of Aristotle's Physics*, 19–30; "The Structure of Abū l-Ḥusayn al-Baṣrī's Copy of Aristotle's *Physics*"; Lettinck, *Aristotle's Physics and its Reception in the Arabic World*, 1–6; Arzhanov and Arnzen, "Die Glossen in Ms. *Leyden or. 583*," 431–434.

²⁷ For the identification of the scribe Abū l-Ḥakam with the poet Abū l-Ḥakam al-Mağribī, cf. Stern, "Ibn al-Samḥ," 34–36.

²⁸ For the identification of Abū l-Ḥusayn with the Mu'tazili theologian, cf. Stern, "Ibn al-Samḥ," 36–38; cf. also Kraemer, *Humanism in the Renaissance of Islam*, 131; Madelung, "Abū l-Ḥusayn al-Baṣrī."

²⁹ On the Baḡdād Peripatetics, cf. Kraemer, *Humanism in the Renaissance of Islam*, 104–139.

whom was Ibn al-Samḥ's fellow al-Ḥasan ibn Suwār ibn al-Ḥammār (d. after 407/1017). Ibn 'Adī himself studied under Abū Bišr Mattā ibn Yūnus (d. 328/940).³⁰

What we today find in Ms. Leiden or. 583, then, is a faithfully transcribed text of Iṣḥāq ibn Ḥunayn's translation supplemented with comments, notes, objections, and philological remarks by Abū l-Ḥusayn, Ibn al-Samḥ, Ibn al-Ṭayyib, Ibn 'Adī, Abū Bišr, and an otherwise little known Abū 'Amr (or Abū 'Umar) al-Ṭabarī, who probably was a student of Abū Bišr and Ibn 'Adī.³¹ All these thinkers drew upon Arabic translations of Alexander's commentary on the *Physics* as well as the paraphrase by Themistius (d. ~ 385) and, most of all, the commentary of Philoponus.³² It is no exaggeration to say that they used Philoponus as their guide and model for reading Aristotle's *Physics*. Moreover, the Leiden manuscript also attests to the translation efforts of Qusṭā and al-Dimašqī – at times discussing variant readings to Iṣḥāq ibn Ḥunayn's translation, and even to Syriac sources of Aristotle's work and Alexander's commentary.³³

Giannakis' analysis of the manuscript and its contents suggests that Abū l-Ḥusayn's compilation, which combined the Arabic text of Aristotle's *Physics* together with comments and remarks from his teachers, was only one of a number of such compilations. In fact, it is reasonable to assume that students, if they themselves possessed a copy of a text, may have taken notes from the lessons they had with their teachers. Likewise, it is no less plausible that teachers preserved their own readings together with the results of their own examination of a text in the form of a personal copy enriched with glosses and annotations of their own as well as quotations from the available secondary literature. In particular, Giannakis hints towards the possible existence of similar compilations by Ibn al-Samḥ and Ibn al-Ṭayyib (recording material from their lessons with Ibn 'Adī), by Ibn 'Adī himself, and by Abū 'Amr al-Ṭabarī (recording material from his lessons with Abū Bišr) as potential models for Abū l-Ḥusayn's own compilation.³⁴ It could be that Ibn al-Samḥ's compilation is identical with the "commentary" or "compendium" (*ṣarḥ ka-l-ḡawāmi'*) which Ibn al-Qiṭṭī attributes to him in the *Ta'riḥ al-ḥukamā'*.³⁵

To what extent these compilations were circulating and, in turn, to what extent Avicenna knew these collections as commentaries on the Aristotelian text is unknown.

³⁰ The list of Ibn 'Adī's students also included eminent members of the philosophical circle around Abū Sulaymān al-Siḡistānī, among them 'Alī Abū Ḥayyān al-Tawḥīdī and Abū 'Alī Aḥmad Miskawayh; cf. Kraemer, *Philosophy in the Renaissance of Islam*, 30f.; *Humanism in the Renaissance of Islam*, 115.

³¹ On Abū 'Amr al-Ṭabarī, cf. Hasnawī, "Un élève d'Abū Bišr Mattā b. Yūnus"; cf. also Giannakis, *Philoponus in the Arabic Tradition of Aristotle's Physics*, 34–37.

³² Badawī published the contents of the manuscript, i.e., both the Aristotelian text in the translation of Iṣḥāq ibn Ḥunayn and the various glosses and commentaries, under the title *al-Ṭabī'a*; cf. also the brief information in Badawī, *La transmission de la philosophie grecque au monde arabe*, 79.

³³ On these Syriac sources, cf. esp. Arzhanov and Arnzen, "Die Glossen in Ms. Leyden or. 583."

³⁴ A puzzling feature of Abū l-Ḥusayn's compilation is that up to *Physics* VI.5 he seems to be drawing on Ibn al-Samḥ's work but then turns to Ibn al-Ṭayyib's for the rest of the *Physics*; cf. also Giannakis, "The Structure of Abū l-Ḥusayn al-Baṣrī's Copy of Aristotle's *Physics*."

³⁵ Ibn al-Qiṭṭī, *Ta'riḥ al-ḥukamā'*, 39.19f.

The mere fact that Abū l-Ḥakam al-Mağribī transcribed a copy of Abū l-Ḥusayn's own compilation, however, indicates that a certain circulation took place and that there was at least some interest in copying and reading such materials. In addition, we can be certain that Avicenna knew most of these figures, and in some of his writings he even responded directly to some of them.³⁶ Consequently, there is good reason to think that Avicenna was in one way or another aware of the fact that some of his contemporaries in Baḡdād read and commented upon Aristotle's *Physics*, and that he may have known some of the interpretations they were putting forth.³⁷ Yet, Avicenna's relation to contemporary Baḡdādī intellectuals clearly deserves more attention than my present study can provide.³⁸ What, nonetheless, emerges from this study is 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 Baḡdād, because he criticises the very way in which they read Aristotle's *Physics*, viz., through Philoponus.³⁹

So much, then, for the evidence about the transmission of the text of Aristotle's *Physics* into Arabic as such. I shall now turn to a more general survey of information about those thinkers from within the Aristotelian tradition whose works on natural philosophy were translated into Arabic, in order to introduce the texts that need to be taken into account – and that this study has taken into account – in elucidating and contextualising the various discussions and arguments we find in Avicenna works on physics. Without laying claim to completeness in any respect, this survey seeks to provide relevant information about 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, and which, for this reason, will reappear, often prominently, in the remainder of this book.

³⁶ cf. Pines, “La ‘philosophie orientale’ d’Avicenne et sa polémique contre les bagdadiens”; Brown, “Avicenna and the Christian Philosophers in Baghdad”; M. Rashed, “Ibn ‘Adī et Avicenne”; Ferrari's remarks in Ibn al-Ṭayyib, *Tafsīr Kitāb al-Maḡlāt*, 23–25; Menn, “Avicenna's Metaphysics,” 153–159; Gutas, *Avicenna and the Aristotelian Tradition*, 53–67; Benevich, “Fire and Heat.” Daiber notes that Ibn Suwār even met Avicenna, and al-Bīrūnī, at the court of the penultimate Ma'mūnid Ḥwārizmshāh Abū l-'Abbās Ma'mūn ibn Ma'mūn (r. 390–407/1000–1017); cf. “The Meteorology of Theophrastus,” 220; cf. also Kraemer, *Humanism in the Renaissance of Islam*, 124–126.

³⁷ What is revealing in this context is Avicenna's explicit reference to both the *Physics* and the inadequacy of the understanding both of the Baḡdād Peripatetics and of Philoponus in his *Letter to Kiyā* contained in *al-Mubāḥaṭāt*, 373.7–11. For the identification of *fulān wa-fulān* in Avicenna's letter with the “Christians from Baḡdād,” cf. Gutas, *Avicenna and the Aristotelian Tradition*, 57.

³⁸ For a valuable exploration of Avicenna's relation to his contemporaries, and in particular those appearing in his *al-Mubāḥaṭāt*, cf. Reisman, *The Making of the Avicennan Tradition*, ch. 3.

³⁹ This is particularly evident in Avicenna's discussion of nature; q.v. below, 256ff.

1.2 The Commentators on the Aristotelian Text

Theophrastus

There is only scarce information about the Arabic transmission of the writings on physics and natural philosophy by Theophrastus of Eresus (d. ~ 287 BC). The evidence has conveniently been listed by Gutas.⁴⁰ Most important, perhaps, is the Arabic version of his *Metaphysics* produced by Ishāq ibn Ḥunayn and recently edited by Gutas as well as his Arabic *Meteorology* translated by Ibn Suwār on the basis of an earlier Syriac version, both published by Daiber.⁴¹ Moreover, Theophrastus was an influential figure in the development of the philosophical concept of place, as a handful of important fragments of his lost work on physics, preserved by Simplicius (d. ~ 560), evince. While it is not clear whether material from this work on physics circulated in Arabic translation and whether it reached Avicenna, his fragments inspired others to object to Aristotle's account and to shape the critical situation to which Avicenna will later react.⁴²

Galen

One respect in which Galen (d. ~ 216) was of importance for Arabic philosophy, is as a transmitter of Plato. Generally, there was not much of Plato's works to be read for Muslim intellectuals.⁴³ That is to say, we find in Arabic works an abundance of sayings attributed to Plato and there certainly was a general and honest interest in – or as Franz Rosenthal put it: “an enthusiastic reception and a vivid echo” of – various aspects of his philosophy, which stands in stark contrast to the fact that not a single one of Plato's dialogues is known to have come down to us in Arabic.⁴⁴ Whether this was primarily due to the involved style of his dialogues or to another reason (or a complex of reasons) is still unknown. As a result, Plato was by all means a prominent figure and a famous philosopher, even though on the whole, his philosophy was overshadowed by the success of Aristotelianism, and ultimately and entirely “eclipsed by the triumph of Avicenna's Peripateticism,” as Gutas put it.⁴⁵ With regard to natural philosophy,

⁴⁰ cf. Gutas, “The Life, Works, and Sayings of Theophrastus in the Arabic Tradition,” 80–82; cf. also Theophrastus, *Sources for his Life, Writings, Thought and Influence*, 276–435.

⁴¹ Theophrastus, *On First Principles* (known as his *Metaphysics*); *Meteorology*.

⁴² cf. also Steinmetz, *Die Physik des Theophrastos von Eresos* and the remarks by Daiber in “The *Meteorology* of Theophrastus,” 167. Steinmetz suggests an influence of Theophrastus on Avicenna in matters of mineralogy (*Die Physik des Theophrastos von Eresos*, 322).

⁴³ cf. Arnzen, “Plato's *Timaeus* in the Arabic Tradition,” esp. 181–198; cf. also Hasse, “Plato arabico-latinus”; Gutas, “Platon.”

⁴⁴ Rosenthal, “On the Knowledge of Plato's Philosophy in the Islamic World,” 393.

⁴⁵ Gutas, “Platon,” 849.

however, there was at least, thanks to Galen, a paraphrase of the *Timaeus*, which was translated into Syriac by Ḥunayn ibn Ishāq and subsequently from Syriac into Arabic by his colleague ʿĪsā ibn Yaḥyā ibn Ibrāhīm. The Arabic version has been published by Paul Kraus and Richard Walzer in 1951 together with their own Latin translation.⁴⁶

In addition to that, philosophers in the Arabic tradition were also informed about the opinions Galen himself held about some of the subjects usually treated in physics. In part, his views reached them through the writings of other or later authors and commentators. In particular, Alexander's critical engagement with Galen on time, place, and motion provided an, albeit biased, picture of Galen's sceptical attitude towards certain aspects of Aristotelian natural philosophy. An intriguing testimony in this regard is a letter written by Ibn Abī Saʿīd al-Mawṣilī (fl. fourth/tenth century) in Mosul and addressed to Ibn ʿAdī in Baḡdād, containing philosophical questions on a number of subjects. One of the questions concerns the nature of time and asks whether Aristotle's or rather Galen's position is correct. It is in this context also explicitly stated that Ibn Abī Saʿīd derived his information from a treatise by Alexander that contradicts (*nāqaḍahū*) Galen's views on time and place.⁴⁷ One should, however, take notice also of the more reserved interpretation of Alexander's purported polemics against Galen advanced by Fritz Zimmermann and Silvia Fazzo.⁴⁸

Apart from the indirect transmission of Galen's thoughts, there was also a direct transmission of his works into Arabic. This includes, of course, his medical corpus among which, for example, his *De elementis ex Hippocratis sententia* proved to be a particularly rich source for the discussion of corporeality as well as atomistic and non-atomistic elemental theories. The history of its transmission is complex. In addition to an Arabic translation the work itself, there exist epitomes of it in both Greek and Arabic as well as further abridgements and commentaries, attesting to its favourable reception and widespread dissemination.⁴⁹ One of the Greek epitomes was translated into both Syriac and Arabic by Ḥunayn ibn Ishāq, and recently published in edition and translation by John Walbridge as *Ġawāmiʿ Kitāb Ḡālīnūs fī l-ʿanāṣir ʿalā raʾy Ibuqrāt*.⁵⁰ Another important example is Galen's no longer extant work *On Demonstration*, which was at least partially available in a Syriac and Arabic versions produced, again, in the

⁴⁶ Galen, *Compendium Timaei Platonis*.

⁴⁷ Ibn ʿAdī, *Kitāb Aḡwiba Biṣr al-Yahūdī ʿan masāʾilihi*, esp. 318.6–319.3; cf. also Furlani, “Le ‘Questioni filosofiche’ di Abū Zakariyā Yaḥyā b. ʿAdī”; Pines, “A Tenth Century Philosophical Correspondence,” 111f.; Sharples' remarks in Alexander of Aphrodisias, *On Time*, 72f.; Adamson, “Galen and al-Rāzi on Time.”

⁴⁸ Zimmermann, “al-Farabi und die philosophische Kritik an Galen”; Fazzo, “Alexandre d'Aphrodise contre Galien.”

⁴⁹ cf. De Lacy's remarks in Galen, *De elementis ex Hippocratis sententia*, 20–25; cf. also Langermann, “Islamic Atomism and the Galenic Tradition”; Bos and Langermann, “An Epitome of Galen's *On The Elements* Ascribed to Ḥunayn Ibn Ishāq.”

⁵⁰ Walbridge, *The Alexandrian Epitomes of Galen*, 131–186.

circle of Ḥunayn ibn Isḥāq.⁵¹ It is known that this voluminous work was not exclusively devoted to logic and covered several topics of cosmology and natural philosophy.⁵² We shall come across it prominently when investigating Avicenna's views on time.

Alexander of Aphrodisias

Alexander's commentary on Aristotle's *Physics* is almost entirely lost in both Greek and Arabic. In fact, Ibn al-Nadīm's *Kitāb al-Fihrist* contains an anecdote which may suggest that copies of Alexander's commentary may already have been rare in the fourth/tenth century.⁵³ It is through the commentaries of later authors, in particular Simplicius, that we have the chance of retrieving fragments of his comments. Simplicius' writings are generally a rich source for statements of earlier authors, as he often provides or discusses selected passages from a variety of sources, including Alexander, whom he often quotes and sometimes mentions by name. Recently the situation concerning Alexander's commentary improved dramatically when Marwan Rashed published

51 cf. Ḥunayn ibn Isḥāq, *Risāla fī ḍikr mā turǧima min kutub Ḡālīnūs*, 47.10–48.8 (ed. Bergsträßer)/117.7–119.5 (ed. Lamoreaux); cf. also von Müller, *Ueber Galens Werk vom wissenschaftlichen Beweis*; Rescher, "New Light from Arabic Sources on Galen," 29f.

52 cf. Chiaradonna, "Le traité de Galien *Sur la démonstration*"; Adamson, "Galen and al-Rāzī on Time"; "Galen on Void," 197; Koetschet, "Galien, al-Rāzī, et l'éternité du monde."

53 Ibn al-Nadīm relates that the apparent bibliophile Ibn 'Adī was offered copies of Alexander's commentaries on the *Physics* and the *Posterior Analytics* for one hundred and twenty dinars. While Ibn 'Adī was trying to get the money together, the books were sold in a package with others to another customer for three thousand dinars, leaving Ibn 'Adī probably somewhat disgruntled about the missed opportunity; cf. *Kitāb al-Fihrist*, vol. 1, 252.27–253.2 (ed. Flügel)/vol. 2, 174.5–9 (ed. Sayyid); cf. also Kraemer, *Humanism in the Renaissance of Islam*, 105. Unfortunately, it is not stated whether the offered codices were in Arabic, Syriac, or Greek, nor is it clear whether this anecdote took place before or after Ibn 'Adī revised al-Šābi's translation of Alexander's commentary on book I of the *Physics* and before he himself rendered book II into Arabic on the basis of Ḥunayn ibn Isḥāq's Syriac version. A second anecdote, however, specifically speaks of Isḥāq ibn Ḥunayn's translations of the *De sophisticis elenchis*, the *Rhetoric*, and the *Poetics* which Ibn 'Adī tried to acquire all together for fifty dinars; cf. *Kitāb al-Fihrist*, vol. 1, 253.2–4 (ed. Flügel)/vol. 2, 174.9–11 (ed. Sayyid). Of these three works, Ibn al-Nadīm tells us elsewhere that Isḥāq ibn Ḥunayn, indeed, translated the *Rhetoric* into Arabic; cf. *Kitāb al-Fihrist*, vol. 1, 250.1 (ed. Flügel)/vol. 2, 164.15 (ed. Sayyid). If, then, the first anecdote is also concerned with (Arabic) translations, then this may suggest that there was a (complete?) Arabic translation of Alexander's commentary extant at the time of Ibn 'Adī, which was probably a version not translated by himself, as otherwise he certainly would have kept a copy. However, it is not clear in light of the evidence discussed above who the translator of this complete version of Alexander's commentary would have been (Qustā?), so that the first anecdote, which does not explicitly mention translations, may rather have been about a Greek original. At any rate, the anecdote suggests that Alexander's commentary already may have been difficult to acquire in either language, especially as otherwise the anecdote would not be worth telling in the first place. What is more, Alexander's commentary on Aristotle's *Posterior Analytics* was apparently not extant either, as Ibn al-Nadīm states elsewhere, cf. *Kitāb al-Fihrist*, vol. 1, 249.13 (ed. Flügel)/vol. 2, 163.4f. (ed. Sayyid)

a volume containing 826 fragments from Alexander's commentary that have been preserved in the margins of two manuscripts stored in the Bibliothèque nationale de France in Paris (Ms. Supplément grec 643 and Ms. grec 1859).⁵⁴ Moreover, M. Rashed systematically compared these fragments with the testimony provided by Simplicius.

There are also a number of fragments preserved in Arabic in the marginal notes contained in Ms. Leiden or. 583, the manuscript of Ishāq ibn Ḥunayn's translation of Aristotle's *Physics*. These have been extracted and published by Giannakis.⁵⁵ Most of them can be traced to quotations provided by Philoponus in his commentary on the *Physics*.⁵⁶ It is, therefore, not entirely clear from which translation they derive: a translation of Philoponus' commentary containing these passages, in which case we must consider Ibn Nā'ima and Qusṭā as the responsible translators, or a translation of Alexander's own commentary, in which case there are Ibn 'Adī (book II), Qusṭā (at least books IV, V, VII), al-Dimašqī (book IV), and the translator of books VI and VIII, whose name is not known.⁵⁷

In addition to this, a number of treatises attributed to Alexander are extant in Arabic. Among them is his already mentioned refutation of Galen's views on motion, which has been edited and translated by Nicholas Rescher and Michael E. Marmura.⁵⁸ It has been suggested by Shlomo Pines and Jules Janssens that this treatise influenced Avicenna's views on motion and natural motion.⁵⁹ There is, second, the well-known *Maqālat al-Iskandar al-Afrūdīsī fī l-zamān*. This treatise on time is extant in an Arabic version by Ḥunayn ibn Ishāq, which was edited by 'Abd al-Raḥmān Badawī, and a Latin translation from the Arabic by Gerard of Cremona (d. 1187), which was edited by Gabriel Théry.⁶⁰ It has been suggested by Théry, and accepted by Rescher and Marmura, that this treatise, too, is an excerpt from Alexander's commentary on the *Physics*.⁶¹ However, it seems more likely that Alexander's extant treatise on time constitutes one

54 Alexander of Aphrodisias, *Commentaire perdu à la Physique d'Aristote*.

55 Giannakis, "Fragments from Alexander's Lost Commentary on Aristotle's *Physics*."

56 Giannakis, *Philoponus in the Arabic Tradition of Aristotle's Physics*, 75–80; "Fragments from Alexander's Lost Commentary on Aristotle's *Physics*," 158f. Peters notes about Alexander's commentary on Aristotle's *Posterior Analytics* that it may also have been known exclusively through quotations in other commentaries, especially in that of Philoponus; cf. *Aristoteles Arabus*, 18.

57 As mentioned above, the unknown translator may have been Qusṭā. Of book I, translated by al-Ṣābi' and revised by Ibn 'Adī, no fragment of Alexander survives in the margins Ms. Leiden or. 583.

58 Alexander of Aphrodisias, *Risālat al-Iskandar al-Afrūdīsī fī anna kull mā yataḥarraku fa-innamā yataḥarraku 'an muḥarrik*.

59 cf. Pines, "Omne quod movetur necesse est ab aliquo moveri," 49–54; Janssens, "L'Avicenne latin," 93–97; "Ibn Sīnā," 84; q.v. below, 242ff.

60 Badawī, *Ṣurūḥ 'alā Aristū mafqūda fī l-yūnāniyya wa-rasā'il uḥrā*, 19–24; Théry, *Autour du décret de 1210*, vol. 2, 92–97.

61 Théry, *Autour du décret de 1210*, 97; Alexander of Aphrodisias, *Risālat al-Iskandar al-Afrūdīsī fī anna kull mā yataḥarraku fa-innamā yataḥarraku 'an muḥarrik*, fn. 8, 12.

half of his otherwise lost *Kitāb Radd 'alayhi* [sc. *Ġālīnūs*] *fī l-zamān wa-l-makān*, which is attested in Ibn al-Nadīm's *Kitāb al-Fihrist*.⁶²

There is, furthermore, the influential *Maqāla fī l-qawl fī mabādī' al-kull*.⁶³ That its attribution to Alexander has been contested by Pines and Gutas (but defended by Charles Genequand) should not distract from the fact that Avicenna knew it as a treatise by Alexander and that he appreciated it as a philosophical work just as much as he valued its author as a philosophical writer and commentator.⁶⁴ The treatise is extant in two different Arabic translations, of which one is incomplete. The complete version was edited and translated first by Badawī and a second time, together with the incomplete version, by Genequand.⁶⁵ An abridged Syriac adaption from the hands of Sergius of Rēš 'Aynā (d. 536) has been edited by Emiliano Fiori.⁶⁶

Finally, several extant fragments also attest to an Arabic translation of Alexander's *Quaestiones*. This work is an interesting collection of issues that seem to have arisen within the context of teaching Aristotelian philosophy together with proposed solutions. These questions may be read independently as an elaboration on specific problems of Aristotelian exegesis. However, due to the wide range of topics covered, they can also be used for the purpose of forming an idea about what Alexander may have argued for in his longer, but no longer extant, commentaries, not only the one on the *Physics* but also those on the *Categories*, *Posterior Analytics*, *De anima*, and *De caelo*, for example.⁶⁷ In the introduction to the first volume of his translation of the *Quaestiones*, Robert W. Sharples issues the note of caution that not all answers may have been written by Alexander himself, as he observed certain differences between some of the answers and what Alexander wrote elsewhere in his surviving works.⁶⁸ Again, questions about authenticity need not concern the historian interested in the formation of Avicenna's philosophy, because if there was a translation of the *Quaestiones* circulating under the

⁶² Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 253.5f. (ed. Flügel)/vol. 2, 173.13 (ed. Sayyid); cf. also Zimmermann, "al-Farabi und die philosophische Kritik an Galen," fn. 49, 410; Sharples' remarks in Alexander of Aphrodisias, *On Time*, 67f., 72–78; Adamson, "Galen and al-Rāzī on Time," 6.

⁶³ The treatise has been discussed in Pines, "Omne quod movetur necesse est ab aliquo moveri," esp. fn. 85, 42f. and more recently in Endreß, "Alexander Arabus on the First Cause"; D. King, "Alexander of Aphrodisias' *On the Principles of the Universe* in a Syriac Adaptation"; Fazzo and Zonta, "Towards a Textual History and Reconstruction of Alexander of Aphrodisias's Treatise *On the Principles of the Universe*."

⁶⁴ cf. *al-Ilāhiyyāt* IX.2.25, 392.17–393.1 = *al-Nağāt* IV.2.30, 635.6f. ≈ *al-Mabda' wa-l-ma'ād* I.45, 62.5; cf. also Bertolacci, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb al-Šifā'*, 443–447, esp. fn. 22, 444f. For Pines' and Gutas' arguments against the authenticity of the text, cf. Pines, "The Spiritual Force Permeating the Cosmos"; Gutas, *Avicenna and the Aristotelian Tradition*, 245–248, esp. fn. 46, 247; for Genequand's defence, cf. his notes in Alexander of Aphrodisias, *On the Cosmos*, 1–3.

⁶⁵ Badawī, *Aristū 'inda l-'arab*, 253–277; Alexander of Aphrodisias, *On the Cosmos*; cf. also Badawī's French translation in his *La transmission de la philosophie grecque au monde arabe*, 121–139.

⁶⁶ Fiori, "L'épitomé syriaque du *Traité sur les causes du tout* d'Alexandre d'Aphrodise."

⁶⁷ On Alexander's lost works, cf. D. Frede, "Alexander of Aphrodisias," ch. 1.2.

⁶⁸ cf. Sharples' remarks in Alexander of Aphrodisias, *Quaestiones* 1.1–2.15, 3f.

name of Alexander, Avicenna would have duly appreciated its contents. In brief, we may say that whatever existed in Arabic translation in the name of Alexander must be considered as a potentially influential source for Avicenna's philosophy, irrespective of the correctness of that attribution.

Plotinus

There is no doubt about the importance of Plotinus (d. 270) for the study of Arabic philosophy. As is well known, parts of his *Enneads* were available in an Arabic version. This version has been produced in the circle of al-Kindī, primarily by Ibn Nā'ima, and was even redacted by al-Kindī himself. Later, part of it circulated under the titles *Kitāb Aristāṭālīs al-faylasūf al-musammā bi-l-yūnāniyya Uṭlūḡiyā* and *Risāla fī l-'ilm al-ilāhī*, and as a collection of sayings attributed to “the Greek Sage” (*al-ṣayḡ al-yūnānī*).⁶⁹ Most of the materials contained in them stem from Plotinus' *Enneads* IV–VI. It has convincingly been argued that these three separate collections go back to an earlier, and presumably more complete, compilation or translation of the *Enneads*.⁷⁰ Thus, there may have been more material from the whole of the *Enneads* that was in circulation – in one form or another – at the time of Avicenna, even though it is not known to be extant today.

What is more, in some parts of his *Enneads*, Plotinus carefully scrutinises various concepts which Aristotle had developed in his writings. One striking example in this regard is Plotinus' critical review of Aristotle's account of time in *Enneads* III.7.⁷¹ It is, then, not only Plotinus' own Platonist philosophy as a whole but also the detailed criticism of Aristotle which was greatly influential on subsequent philosophers and commentators on Aristotle, shaping their way of reading and interpreting both Plato and Aristotle. It is, thus, again the whole of Plotinus' *Enneads*, and not only their famous second half, that is to be considered when investigating the influence Plotinus had on the Arabic philosophical tradition.

Porphyry

As already mentioned, it is known that Porphyry wrote a work on Aristotle's *Physics*. This work probably contained a commentary on books I–IV and a synopsis of book V. According to Ibn al-Nadīm, the commentary section on books I–IV was extant at his

⁶⁹ They are edited by Badawī in *Aflūḡin 'inda l-'arab*, 1–164, 165–183, 184–194, respectively.

⁷⁰ Kraus, “Plotin chez les Arabes,” cf. Rosenthal, “aṣ-Ṣayḡ al-yūnānī and the Arabic Plotinus Source”; Zimmermann, “The Origins of the So-Called *Theology of Aristotle*”; Adamson, *The Arabic Plotinus*; D'Ancona, “La Teologia neoplatonica di 'Aristotele.’”

⁷¹ cf. esp. *Enn.* III.7.9.

time in an Arabic translation by Basīl. Although it can be assumed that Basīl's translation may have been known in the circle of Ibn 'Adī, it is not mentioned in any of the comments preserved in Ms. Leiden or. 583. Moreover, it cannot be determined whether Avicenna had access to Basīl's translation and made use of Porphyry's comments. Apart from fragments, the commentary is not known to be extant in any substantive form in Greek and even less so in Arabic.

Themistius

More obviously relevant is Themistius' explanatory, and at times quite elaborate, paraphrase of Aristotle's *Physics*. Its transmission, however, is complex and far from clear. There is, first, the information provided by Ibn al-Nadīm, which seems to attribute to Abū Bišr a Syriac translation of the commentary of Themistius on the *Physics* (*tafsīr tafsīr Tāmisīyūs li-hāḍā l-kitāb bi-l-suryāniyya*).⁷² Yury Arzhanov and Rüdiger Arnzen convincingly argue that the term *tafsīr* in the first occurrence here means "interpretation" in the sense of "translation" rather than in the sense of "commentary."⁷³ This is supported by the fact that Ibn al-Qiftī, and subsequently Ḥāḡḡī Ḥalīfa (d. 1657), replaced *tafsīr* in the first occurrence by *naql* ("translation").⁷⁴

Arzhanov and Arnzen further maintain that it is this first occurrence of *tafsīr* that is specified by the subsequent expression *bi-l-suryāniyya*, so that the statement testifies to a Syriac translation of the commentary which Themistius wrote "on this book" (*li-hāḍā l-kitāb*), viz., the *Physics* of Aristotle. This, however, is puzzling, because we know Abū Bišr as a translator not from Greek into Syriac but from Syriac into Arabic.⁷⁵ Moreover, in the famous debate between Abū Bišr and the grammarian Abū Sa'īd al-Ḥasan al-Sīrāfi (d. 368/979), which was recorded by 'Alī Abū Ḥayyān al-Tawḥīdī (d. 414/1023) in his *Kitāb al-Imtā' wa-l-mu'ānasa*, al-Sīrāfi accuses Abū Bišr precisely of being ignorant of the language of the Greeks, stating that he translates only on the basis of earlier Syriac translations.⁷⁶ While it is, of course, possible that the information contained in al-Tawḥīdī's record of that debate is inaccurate regarding Abū Bišr's knowledge of the Greek language, this does not seem to be likely, as it would jeopardise one of the central points within the whole debate. It is, then, more plausible to read the information provided by Ibn al-Nadīm in such a way that Abū Bišr translated

⁷² Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 250.22f. (ed. Flügel)/vol. 2, 167.6f. (ed. Sayyid); cf. Steinschneider, *Die arabischen Übersetzungen aus dem Griechischen*, 54; Arzhanov and Arnzen, "Die Glossen in Ms. Leyden or. 583," 430f.; Janos, "Active Nature and Other Striking Features," 137.

⁷³ Arzhanov and Arnzen, "Die Glossen in Ms. Leyden or. 583," fn. 79, 430, referring to Gutas, "Aspects of Literary Form and Genre in Arabic Logical Works," 32f.

⁷⁴ Ibn al-Qiftī, *Ta'riḥ al-ḥukamā'*, 39.7; Ḥāḡḡī Ḥalīfa, *Kašf al-zunūn*, §7258, 619.11.

⁷⁵ cf. Endreß, "Mattā b. Yūnus," 844b.

⁷⁶ al-Tawḥīdī, *Kitāb al-Imtā' wa-l-mu'ānasa*, vol. 1, 111.11–14.

Themistius' commentary on the *Physics* on the basis of an earlier Syriac translation into Arabic. Moreover, the actual wording of Ibn al-Nadīm's text bears this out, as the specification *bi-l-suryāniyya* is modifying not the first but the second occurrence of *tafsīr*, just as the preceding qualification *li-hāḍā l-kitāb* does: what Abū Bišr translated, then, was the "commentary of Themistius" (*tafsīr Ṭāmiṣṭiyūs*) which is "on this book" (*li-hāḍā l-kitāb*), viz., the *Physics*, and which was "in the Syriac language" (*bi-l-suryāniyya*), translating it, of course, from Syriac into Arabic.⁷⁷ This interpretation has the further advantage that it actually explains the existence of an Arabic version of Themistius' commentary which, indeed, is attested through the following information.

In Ibn al-Qiṭṭī's *Ta'riḥ al-ḥukamā'*, we read that the physician Abū l-Farağ Ğūrğīs ibn Ibrāhīm al-Yabrūdī (d. ~ 442/1050), who was a student of Ibn al-Ṭayyib, furnished the margins of an Arabic copy of Philoponus' massive, ten-volume long commentary with excerpts from – or perhaps even the whole of – Themistius' paraphrase.⁷⁸ Earlier this same codex had been in the possession of 'Īsā ibn 'Alī (d. 391/1001), the son of vizier 'Alī ibn 'Īsā ibn al-Ġarrāḥ (d. 334/946) whose secretary, the above-mentioned al-Ṣābi' had translated the first book of Aristotle's work "with the commentary" of Alexander into Arabic. Subsequently, al-Ṣābi's translation was revised by Ibn 'Adī, who, Ibn al-Qiṭṭī continues, read together with the vizier's son Philoponus' commentary on Aristotle's *Physics* from the very copy into whose margins al-Yabrūdī later added Themistius' paraphrase (of course, after 'Īsā ibn 'Alī had added his own remarks on the basis of Ibn 'Adī's teachings). Regardless of whether or not we believe every detail of this story, it certainly indicates that not long after the turn of the fifth/eleventh century, i.e., during Avicenna's most active phase, Themistius' paraphrase had gained a prominent place in philosophical study circles alongside Philoponus' famous commentary.

Taking it all together, then, knowledge about Themistius' interpretations of the topics discussed in Aristotle's *Physics* could be gathered from three distinct sources: first,

⁷⁷ Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 250.22f. (ed. Flügel)/vol. 2, 167.6f. (ed. Sayyid). Furthermore, Ibn al-Nadīm states that of Themistius' commentary only "part of the first book was extant in Syriac" (*mawğūd suryānī bi-ba'ḍ min al-maqāla al-ūlā*). This is to be taken as a statement about the defective condition of the Syriac text which Abū Bišr was translating into Arabic. Yet, whether the Syriac text was already incomplete before Abū Bišr's efforts, so that his translation would likewise only have covered parts of the first book, or whether it became defective afterwards, so that Abū Bišr's translation may have been complete after all, is not clear. At any rate, Ibn al-Qiṭṭī's version of the same report provides a textual variant to the testimony transmitted through Ibn al-Nadīm's *Kitāb al-Fihrist*. According to Ibn al-Qiṭṭī, it was only part of the first book which was *lacking* (*yanquṣu ṣay' min al-maqāla al-ūlā*), instead of only this part being *extant* (*Ta'riḥ al-ḥukamā'*, 39.8, following the suggestion by Arzhanov and Arnzen to read *yanquṣu* for *bi-naqṣ*). In either case, however, it is clear that there was an Arabic translation of Themistius' commentary, that Abū Bišr produced it on the basis of an earlier Syriac version, and that it may have been incomplete. As we shall see now, it is most probable that Abū Bišr's translation was, in fact, complete or almost complete.

⁷⁸ Ibn al-Qiṭṭī, *Ta'riḥ al-ḥukamā'*, 39.14–19; cf. also Arzhanov and Arnzen, "Die Glossen in Ms. Leyden or. 583," 433, 443.

there was Abū Bišr's Arabic translation; second, there were more or less complete excerpts from that translation added to the margins of other works; and finally, there was the indirect transmission through occasional quotations in Philoponus' commentary.

Themistius certainly knew some of Galen's works on the subjects treated within natural philosophy, as he occasionally discusses his tenets critically, as we shall see. He was also acquainted with Alexander's commentary of the *Physics* as well as with some other treatises by Alexander, among which we may assume not only the polemics against Galen but also some of Alexander's more independent treatises, such as the *De mixtione*, to which Themistius explicitly refers in the discussion of place.⁷⁹ Furthermore, as has been shown by Ahmad Hasnawi, Themistius contributed significantly to Avicenna's understanding of motion.⁸⁰ It is also interesting to note that Avicenna explicitly refers to Themistius' paraphrases of the *Physics* and the *De anima* in his correspondence with Abū Rayḥān al-Bīrūnī (d. 440/1048), and that he illustrates in his *al-Samā' al-ṭabī'ī* two forms of accidental motion by means of examples which we find only in Themistius, as we shall see.⁸¹ Finally, Janssens also detected traces of Themistius' paraphrase in Avicenna's discussion of luck and chance in *al-Samā' al-ṭabī'ī* I.13–14.⁸²

Proclus

The *Institutio physica* of Proclus (d. 485) is not a commentary on Aristotle's *Physics*; it is, as Jan Opsomer called it, "a fairly intelligent summary" of Aristotelian materials drawn primarily from *Physics* VI and VIII as well as *De caelo* I.⁸³ As such, it constitutes a self-standing treatise on motion, culminating in the proposition that the first mover, which is responsible for circular motion, is incorporeal.⁸⁴ It has been translated into Arabic and was known to Ibn al-Nadīm under the title *Kitāb Ḥudūd awā'il al-ṭabī'iyyāt*.⁸⁵

⁷⁹ cf. Themistius, *In Phys.*, 104.20f. Alexander's treatise is translated and discussed by Todd in *Alexander of Aphrodisias on Stoic Physics*.

⁸⁰ cf. Hasnawi, "La définition du mouvement dans la *Physique* du *Shifā'* d'Avicenne," §5; Wisnovsky, *Avicenna's Metaphysics in Context*, 52f.; cf. also Janssens, "Ibn Sīnā," 85; McGinnis, "A Medieval Arabic Analysis of Motion at an Instant."

⁸¹ For the reference to Themistius' writings, cf. Avicenna and al-Bīrūnī, *al-As'ila wa-l-aḡwiba*, 25.9–11, 28.13–29.1.

⁸² Janssens, "Ibn Sīnā," 84.

⁸³ Opsomer, "The Integration of Aristotelian Physics in a Neoplatonic Context," 193.

⁸⁴ The treatise certainly deserves more scholarly attention than it has received so far. A highly accurate outline is given by Opsomer, "The Integration of Aristotelian Physics in a Neoplatonic Context," 193–203; cf. also O'Meara, *Pythagoras Revived*, 177–179; Nikulin, "Physica more geometrico demonstrata"; Kutash, "Commentary on Nikulin"; Martijn, *Proclus on Nature*, 216–218.

⁸⁵ Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 252.13 (ed. Flügel)/vol. 2, 173.5 (ed. Sayyid); cf. also Endreß' remarks in Proclus, *Zwanzig Abschnitte aus der Institutio theologica in arabischer Übersetzung*, 27; cf.

Additionally, there are also traces of a partial Arabic translation of Proclus' seminal commentary on Plato's *Timaeus*.⁸⁶

More prominently known was Proclus as the antagonist of Philoponus on the question over the eternity of the world in the latter's *De aeternitate mundi contra Proclum*. Proclus' own work, whose Greek text survives only to the extent it is quoted in Philoponus' refutation, was apparently (partially) translated into Arabic at least twice.⁸⁷ Its refutation by Philoponus likewise existed in an Arabic translation, of which so far only few substantial fragments have come to light, some of which transmitted under the name of Alexander.⁸⁸ This controversy between Proclus and Philoponus was certainly known at the time of Avicenna and was explicitly mentioned by al-Bīrūnī in his correspondence with the young Avicenna.⁸⁹ Together with the Arabic version of the *Institutio physica*, it was arguably possible to construct a picture – however exhaustive or accurate – of Proclus' basic views on physics and cosmology.

Proclus' greatest influence on the Arabic philosophical tradition, however, was rather oblique and circuitous. His *Institutio theologica* happened to be the main source for a compilation which was known in Arabic as the *Kalām fī maḥḍ al-ḥayr* or the *Kitāb al-Īdāḥ fī l-ḥayr al-maḥḍ li-Aristūṭālīs*. It was attributed to Aristotle and even to Alexander but never to Proclus.⁹⁰ The *Kalām fī maḥḍ al-ḥayr* itself circulated in different versions, which were redacted in the circle of al-Kindī, maybe in part even by himself.⁹¹ It has been argued that Avicenna was aware of the *Kalām fī maḥḍ al-ḥayr*

also Pines, "Hitherto Unknown Arabic Extracts from Proclus' *Stoicheiōsis Theologikē* and *Stoicheiōsis Physikē*"; R. Rashed, "Al-Sijzi and Maimonides," 161, and fn. 9, 171.

86 cf. Endreß' remarks in Proclus, *Zwanzig Abschnitte aus der Institutio theologica in arabischer Übersetzung*, 24–26; cf. also Arnzen, "Proclus on Plato's *Timaeus* 89e3–90c7."

87 cf. Endreß' remarks in Proclus, *Zwanzig Abschnitte aus der Institutio theologica in arabischer Übersetzung*, 15–18; cf. also Wakelnig, "The Other Arabic Version of Proclus' *De Aeternitate mundi*." There is now an independent publication of Proclus' work under the title *On the Eternity of the World* on the basis of the text provided in Philoponus' *De aeternitate mundi contra Proclum*; cf. the earlier translation in Baltes, *Die Weltentstehung des platonischen Timaios*, vol. 2, 134–164; cf. also Maróth, "Der erste Beweis des Proklos für die Ewigkeit der Welt."

88 cf. Hasnawi, "Alexandre d'Aphrodise vs Jean Philopon"; Fazzo, "L'Alexandre arabe et la génération à partir du néant"; M. Rashed, "Nouveaux fragments antiprocliens de Philopon en version arabe"; cf. also the minor fragments in al-Bīrūnī's *Kitāb fī taḥqīq mā li-l-Hind min maqūla maqbūla fī l-'aql aw marqūla*, mentioned and discussed in Giannakis, "The Quotations from John Philoponus' *De aeternitate mundi contra Proclum* in al-Bīrūnī's *India*."

89 cf. Avicenna and al-Bīrūnī, *al-As'ila wa-l-aḡwiba*, 52.1f.; cf. also Rowson's comments in al-ʿĀmiri, *A Muslim Philosopher on the Soul and its Fate*, 252, as well as Giannakis, "Proclus' Arguments on the Eternity of the World in al-Shahrastānī's Works"; Chase, "al-Šahrastānī on Proclus."

90 cf. Endreß' remarks and references in Proclus, *Zwanzig Abschnitte aus der Institutio theologica in arabischer Übersetzung*, 7f., 18–23; cf. also Pines, "Hitherto Unknown Arabic Extracts from Proclus' *Stoicheiōsis Theologikē* and *Stoicheiōsis Physikē*"; Zimmermann, "Proclus Arabus Rides Again"; Wakelnig, "Proclus in Aristotelian Disguise."

91 cf. D'Ancona, "Al-Kindī et l'auteur du *Liber de causis*"; Wakelnig, "Proclus in Aristotelian Disguise."

and implemented some of its features into his own metaphysics.⁹² The influence of Proclus through the *Kalām fī maḥd al-ḥayr* on Avicenna, however, was surely more modest than that of Plotinus through the *Theology of Aristotle*, even though it had a severe impact on some of his contemporaries and predecessors.

It remains to be seen in the future to what extent Avicenna was acquainted with Proclus' works on natural philosophy. In the present study, Proclus does not emerge as a primary and direct source for Avicenna's thoughts on the natural world.

John Philoponus

It is no exaggeration to state that for an investigation of the central concepts of Avicenna's natural philosophy, Philoponus' works are the second most important source right after Aristotle's own work.⁹³ In addition to having been acquainted with Philoponus' commentaries on Aristotle, including the one on the *Physics*, Avicenna also must

⁹² cf. D'Ancona, "Avicenna and the *Liber de causis*"; Bertolacci, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb al-Šifā'*, 143f., 458–460.

⁹³ Regarding Philoponus' commentary on the *Physics* as such, there has been quite some dispute during the last three decades, especially concerning its content and dating. In 1985, Verrycken argued that the commentary on the *Physics* bears clear signs of a much later revision, reflecting different stages in the philosophical development of Philoponus, which Verrycken labelled as "Philoponus 1" and "Philoponus 2." It was argued that a later revision would explain, for example, why we find the fierce and brilliant criticism which "Philoponus 2" expressed in his corollary on place alongside the otherwise rather uncritical and straightforward exposition of Aristotle's chapters on place by the hands of "Philoponus 1." According to Verrycken, the critical corollary on place was added to the commentary after the year 529 and represents the more mature position of "Philoponus 2"; cf. Verrycken, *God en wereld in de wijsbegeerte van Ioannes Philoponus*; "The Development of Philoponus' Thought and its Chronology." Verrycken's thesis was met with criticism by a number of scholars and has been defended recently by Verrycken himself; cf. M. Rashed, "Alexandre d'Aphrodise et la 'magna quaestio,'" fn. 56, 100; de Haas, *John Philoponus' New Definition of Prime Matter*, 292f.; Golitsis, *Les commentaires de Simplicius et de Jean Philopon à la Physique d'Aristote*, esp. 27–37; Sorabji, *Philoponus and the Rejection of Aristotelian Science*, 14–18; for the recent defence, cf. Verrycken, "John Philoponus." A second suggestion in contrast to Verrycken's hypothesis was made by Golitsis on the basis of descriptions in the titles of Philoponus' commentaries. He argues that instead of having changed his mind and revising earlier written works at a later time, we should consider Philoponus to have separated between different activities as a commentator and amanuensis of Ammonius, resulting in different positions being expounded in one and the same work; cf. Golitsis, *Les commentaires de Simplicius et de Jean Philopon à la Physique d'Aristote*, esp. 22–27. A third, even though so far widely neglected, conciliatory interpretation of the available evidence has been advanced by Perkams, who investigates the student-teacher relation between Ammonius and Philoponus, and, after reviewing the evidence for Philoponus' commonly assumed year of birth, suggests the year 500 for Philoponus' birth; cf. Perkams, "Zwei chronologische Anmerkungen zu Ammonios Hermeiou und Johannes Philoponos"; cf. also Sorabji's remarks in his introduction to Broadie's translation of book IV.10–14 of Philoponus' commentary; cf. also Sorabji, "New Findings on Philoponus," 16–18, as well as, generally, Sorabji, "John Philoponus," 3–5, 37–40; "Dating of Philoponus' Commentaries on Aristotle."

have been aware of Philoponus' dispute with Proclus on the eternity of the world, as already mentioned, and there is no good reason that he should not also have known Philoponus' *De aeternitate mundi contra Aristotelem*.⁹⁴ Avicenna's views on the natural inclination of bodies, for example, clearly resemble those of Philoponus (and also those of Alexander). Likewise, Avicenna's understanding of the corporeality of natural bodies is coloured by a certain conception within the Peripatetic commentary tradition which found its expression also in the earlier works of Philoponus, in particular in his commentary on the *Physics*.

More often than not, however, Avicenna's stance towards Philoponus is critical rather than commending. Despite the similarities between Avicenna's account of corporeality and that in Philoponus' early works, Avicenna's argument for the existence of matter can be seen as a direct riposte to the argumentation expressed by Philoponus in his late works or, at least, to a reasoning very similar to the one we find in the *De aeternitate mundi contra Proclum*, in which Philoponus decided to abandon his early position and to introduce a new account of matter.⁹⁵ Other than that, Avicenna develops his understanding of nature as a principle of motion in explicit opposition to Philoponus' attempted improvement upon the original Aristotelian doctrine and elaborates his defence of Aristotle's notion of place in what appears to be a direct engagement with the criticism he found in Philoponus' commentary. He also seems to be less impressed by Philoponus' (and Alexander's) appeal to the flowing now as the ultimate cause for the existence of time than contemporary scholarship has so far realised. Moreover, Avicenna's general understanding of the nature of hypotheses and postulates is at variance with that of Philoponus (and Themistius), as will be shown. All this calls to mind how Avicenna, in his *Letter to Kiyā*, speaks disparagingly of Philoponus' wasted efforts in the science of physics.⁹⁶

⁹⁴ On Philoponus' refutation of Aristotle in the Arabic, cf. Kraemer, "A Lost Passage from Philoponus' *Contra Aristotelem* in Arabic Translation," esp. fn. 27, 323f.; Mahdi, "Alfarabi against Philoponus"; MacCoull and Siorvanes, "PSI XIV 1400"; M. Rashed, "The Problem of the Composition of the Heavens"; cf. also Hasnawi, "Alexandre d'Aphrodise vs Jean Philopon"; Giannakis, "The Quotations from John Philoponus' *De aeternitate mundi contra Proclum* in al-Bīrūnī's *India*." In addition to Philoponus' polemics against Proclus and Aristotle, and also to his *De opificio mundi*, which was not translated into Arabic, there must have been at least one further work in which Philoponus, non-polemically as it seems, set out his position regarding the creation of the world. This work, often referred to as *De contingentia mundi*, was apparently likewise available in Arabic, perhaps in an abridged version and may have been the same work as the one to which Simplicius reacted towards the very end of his commentary on the *Physics*; cf. Pines, "An Arabic Summary of a Lost Work of John Philoponus"; Troupeau, "Un épitomé arabe du 'De contingentia mundi' de Jean Philopon"; cf. also the Wildberg's introduction to his translation of that discussion by Simplicius, which was published as *Against Philoponus on the Eternity of the World*.

⁹⁵ Sorabji, *Matter, Space, and Motion*, ch. 2; de Haas, *John Philoponus' New Definition of Prime Matter*.

⁹⁶ q.v. fn. 37 above, 19.

In many ways, then, it appears that Avicenna formed his understanding of the core concepts of natural philosophy through a thorough and critical examination of the views expressed in Philoponus' works, and so it is only natural that a considerable amount of the following investigation is devoted to Philoponus' thought. This focus commends itself also because even before Avicenna, Philoponus has come to occupy a central position in the Arabic tradition of reading the *Physics*. In fact, his commentary is the most important commentary that was translated into Arabic and which is still extant today: Simplicius' commentary on the *Physics* might not have been translated at all; Themistius' paraphrase, though interesting and relevant, is naturally not as straightforward and rich as Philoponus' thorough and critical exposition; and the commentaries of Alexander and Porphyry, although translated into Arabic, are, apart from the indirect transmission and the newly discovered fragments, not extant in either Greek or Arabic.

So, it is *for us* and our analysis of Avicenna's *al-Samā' al-ṭabī'ī* that Philoponus' commentary emerges as the second most important source for physics right after Aristotle. *For Avicenna*, though, the situation may have been somewhat different. It is precisely because Alexander's commentary is not extant in any substantial form in *any* language, that we are frankly unable to assess both the scope of its direct influence on Avicenna's natural philosophy and the extent of its potential indirect influence on Avicenna through Philoponus. Since Avicenna rarely, if ever, cites his sources by name, it may well have been that *for him*, it was Alexander's – and not Philoponus' – commentary that was the second most important source after Aristotle's *Physics*, even though *for us* this simply cannot be determined. Unfortunately, all this is equally true with regard to Porphyry's commentary. What is more, among those works composed in Arabic, there is a potentially analogous case to the loss of Alexander's and Porphyry's Greek commentaries on Aristotle's *Physics*, as the major works on physics that were written by Abū Naṣr al-Fārābī (d. 339/950-51) have not survived either, even though it is virtually certain that Avicenna must have been acquainted with them.⁹⁷ This means that we are deprived of no less than two sources (or three when also counting Porphyry) which are potentially indispensable for a *truly* adequate understanding of the developments in interpreting the *Physics* of Aristotle that lead up to Avicenna's composition of *al-Samā' al-ṭabī'ī*.

On the other hand, the centrality and the dominance of comments ascribed to Yaḥyā al-Naḥwī (i.e., to John Philoponus, "the Grammarian") in the margins of Ms. Leiden or. 583 indicate that it was, nonetheless, Philoponus' commentary which, besides the riches of translated materials available between the second/eighth and fourth/tenth century, was the major source for reading and interpreting Aristotle's *Physics* – even

⁹⁷ In fact, it is *in principle* even possible that Avicenna exclusively relied on al-Fārābī's commentary, so that all he knew of Alexander's and Philoponus' interpretations and theories on physics would have been derived from al-Fārābī. This is a possibility which cannot be ruled out as long as we lack the text of al-Fārābī's commentary or at least sufficient information about it.

more than Alexander's and certainly more than Porphyry's. As Giannakis has shown, most – even if not all – of the comments preserved in the margins of Ms. Leiden or. 583 that are ascribed to Alexander or Themistius can also be found in Philoponus.⁹⁸ Other than that, the name of Philoponus also occurs in Avicenna's correspondence with al-Birūnī on matters pertaining to natural philosophy (but so do Alexander and Themistius, admittedly).⁹⁹

Finally, it ought to be noted that it is not entirely clear in what form Avicenna knew Philoponus' commentary on the *Physics*. As has been mentioned above, the second half of Philoponus' commentary was translated by Ibn Nā'ima and its first half by Qusṭā. Now, it has been argued by Giannakis that it is not certain whether Qusṭā produced a full translation of Philoponus' full commentary on books I–IV, or a full translation of an abridged commentary covering books I–IV, or an abridged translation of a full commentary on books I–IV, or whether his full translation of the commentary on books I–IV was later epitomised. As has also been noted, Qusṭā's translation may have been revised (partially) at one point by al-Dimašqī.¹⁰⁰ All this, however, does not change the fact that Avicenna made heavy use of Philoponus' commentary in whatever form he had access to it and that Philoponus' commentary is nothing other than an indispensable source for understanding the philosophical background to Avicenna's views on natural philosophy, in particular as they are expressed in his *al-Samā' al-ṭabī'ī*. This is all the more true in light of the additional information which Ibn al-Qiṭṭī provided in his *Ta'rīḥ al-ḥukamā'*. As already mentioned above, Ibn al-Qiṭṭī explains that Philoponus' commentary on the *Physics* existed in an Arabic translation as a single complete behemoth of ten volumes.¹⁰¹ Specifically, he writes that Philoponus' work "was translated from Greek into Arabic, and it was a great book of ten volumes and once in my possession" (*malaktuhū duf'atan*).¹⁰² This can mean nothing other than that Philoponus' commentary was available as a complete translation in the seventh/thirteenth century and did not merely circulate in the form of summaries and excerpts.¹⁰³ We have already seen that Ibn al-Qiṭṭī, furthermore, reports that Avicenna's contemporary al-Yabrūdī, a student of Ibn al-Ṭayyib in Baḡdād, added Themistius' "discussion" (*kalām*) to the margins of this very copy, so that it is clear that the whole of Philoponus' commentary was also accessible during Avicenna's own lifetime.

⁹⁸ cf. Giannakis, *Philoponus in the Arabic Tradition of Aristotle's Physics*, 75–82; "Fragments from Alexander's Lost Commentary on Aristotle's *Physics*," 158; cf. also Lettinck, *Aristotle's Physics and its Reception in the Arabic World*, 339.

⁹⁹ cf. Avicenna and al-Birūnī, *al-As'ila wa-l-aḡwiba*, 13.7–9, 25.9–11, 28.13–29.1, 51.13f.

¹⁰⁰ cf. Giannakis, *Philoponus in the Arabic Tradition of Aristotle's Physics*, 84–91; cf. also Arzhanov and Arnzen, "Die Glossen in Ms. *Leyden or. 583*," fn. 93, 433.

¹⁰¹ q.v. above, 27.

¹⁰² Ibn al-Qiṭṭī, *Ta'rīḥ al-ḥukamā'*, 39.14f.

¹⁰³ Nothing, however, precludes the possibility that *additionally* it may have been available in the form of excerpts and summaries also.

Simplicius

Simplicius was a contemporary of Philoponus and responded to him critically. In the Arabic tradition, Simplicius' influence may have been restricted to his comments on Aristotle's *Categories* and the *De anima* as well as to some introductory remarks on the *Elements* of Euclid (fl. ~ 300 BC).¹⁰⁴ It is not clear whether his commentary on the *Physics* was translated into Arabic or not. It has long been accepted that it was not. Only recently have scholars started to question this traditional consensus.¹⁰⁵

Having said this, Simplicius' commentary on the *Physics* still is an important text for the present study due to the following reasons. First, a comparison of Simplicius' comments with those of his contemporary Philoponus enables us to understand more properly the philosophical developments that took place in Neoplatonic circles in and before the sixth century, i.e., not all too long before the Graeco-Arabic translation movement set in and shaped the philosophical understanding in Arabic intellectual circles before Avicenna. Second, it is an invaluable source for opinions and positions expressed by earlier figures within the history of philosophy, such as Theophrastus, Eudemus of Rhodes (d. ~ 300 BC), and Porphyry, to name only a few. In many instances, Simplicius preserves material which is otherwise lost, so that it is only through the testimonies provided in his commentary that one can gather insights into earlier philosophical debates which ultimately may also have shaped Philoponus' understanding of physics and, thus, through Philoponus also Avicenna. Third, Simplicius is also the most important source for fragments of Alexander's commentary on the *Physics* in addition to the above-mentioned 826 fragments which were recently discovered and published by M. Rashed.

Arabic Commentaries

Of Arabic commentaries on the *Physics* up to the time of Avicenna, close to nothing is extant. Ibn al-Nadīm mentions a handful of commentaries on Aristotle's *Physics*, referring to Ṭābit ibn Qurra, Abū Aḥmād ibn Yazīd al-Kātib known as Ibn Karnīb (fl. late third/early tenth century), and Abū l-Farağ Qudāma ibn Ḡa'far al-Kātib al-Baḡdādī (d. ~ 337/949).¹⁰⁶ Their commentaries or expositions – Ibn al-Nadīm uses the verb *fassara* – did not survive.¹⁰⁷ As already noted, Ibn al-Qifṭī additionally reports on the

¹⁰⁴ cf. Gätje, "Simplikios in der arabischen Überlieferung"; Hadot, "The Life and Work of Simplicius in Greek and Arabic Sources"; Gutas, "Greek Philosophical Works Translated into Arabic."

¹⁰⁵ In particular, Jens Ole Schmitt informed me of fragments and ideas from Simplicius' commentary that are preserved in the section on physics of Barhebraeus' Syriac compendium known as *Butyrum sapientiae*. Schmitt is currently preparing an edition with translation and commentary of that work.

¹⁰⁶ On Ṭābit ibn Qurra's commentary, q.v. above, 12.

¹⁰⁷ cf. Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, 250.23–27 (ed. Flügel)/vol. 2, 167.8–12 (ed. Sayyid); cf. also M. Rashed, "Thābit ibn Qurra, la *Physique* d'Aristote et le meilleur des mondes."

glosses which ʿĪsā ibn ʿAlī, the son of vizier ʿAlī ibn ʿĪsā ibn al-Ġarrāh, added to his copy of Philoponus' commentary on the basis of his readings of the text with Ibn ʿAdī. This copy is not known to be extant. Ibn al-Qifṭī further mentions a commentary by Ibn al-Samḥ, yet this may merely be a reference to his glosses surviving in the margins of Ms. Leiden or. 583 alongside those of Abū l-Ḥusayn, Ibn al-Samḥ, Ibn al-Ṭayyib, Ibn ʿAdī, Abū Bišr, and al-Ṭabarī.¹⁰⁸

It has also been mentioned already that according to Ibn al-Nadīm, al-Kindī composed a work on physics. We also know that Abū Bakr Muḥammad ibn Zakariyāʾ al-Rāzī (d. 313/925) wrote a work which he himself described as “our book on the introduction into natural philosophy called the *Physics*” (*kitābunā fī l-madḥal ilā l-ʿilm al-ṭabīʿī l-mawsūm bi-Samʿ al-kiyān*).¹⁰⁹ Neither is known to be extant.

Next, Ibn Abi Uṣaybiʿa (d. 668/1270) tells us that the philosopher Abū ʿAlī Muḥammad ibn al-Hayṭam (fl. fifth/eleventh century) wrote expositions or summaries (sg. *talḥiṣ*) of the *Physics*, of the *Meteorologica*, and of the “animal books” of Aristotle as well as a treatise on time and place in which he followed Aristotle's opinion (*yalzamu raʾy Aristūṭālīs*).¹¹⁰ As Roshdi Rashed argued, repeatedly and convincingly, Muḥammad ibn al-Hayṭam should not be confused with the famous optician al-Ḥasan ibn al-Ḥasan ibn al-Hayṭam (d. after 430/1040) who, then, did *not* write a commentary on the *Physics*, as is usually assumed, but who, nonetheless, composed a treatise on the Aristotelian notion of place.¹¹¹

Moreover, al-Bīrūnī had a great interest in physical matters, which is attested through his many scientific writings, but he did not write a commentary proper on Aristotle's *Physics*.¹¹² Nonetheless, some of his thoughts pertaining to natural philosophy are recorded in his correspondence with Avicenna.

In addition to that, there are, of course, the later commentaries by Abū Bakr Muḥammad ibn Bāġġa (d. 533/1139) and Averroes (d. 595/1198), which could not adequately been taken into account in this study, even though they surely contain valuable information about physical concepts and theories in the Greek and the Arabic philosophical traditions before Avicenna.¹¹³

¹⁰⁸ Ibn al-Qifṭī, *Taʾrīḥ al-ḥukamāʾ*, 39.13–21.

¹⁰⁹ Abū Bakr al-Rāzī, *Kitāb al-Sīra al-falsafiyya*, 198.1f.

¹¹⁰ Ibn Abi Uṣaybiʿa, *ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ*, vol. 2, 97.3f., 17f.

¹¹¹ cf. R. Rashed, *Les mathématiques infinitésimales*, vol. 2, 8–19; vol. 3, 937–941; vol. 4, 957–959.; cf. also Steinschneider, *Die arabischen Übersetzungen aus dem Griechischen*, 54, who lists “Ibn Heitham” as an author of a “paraphrase” of the *Physics* without, however, mentioning the rest of the name.

¹¹² cf. the list of works al-Bīrūnī himself appended to his list of Abū Bakr al-Rāzī's writings, edited by Kraus as al-Bīrūnī, *Risāla li-l-Bīrūnī fī fihrist kutub Muḥammad ibn Zakariyāʾ al-Rāzī*, esp. 30–43 and translated by Boilot, “L'œuvre d'al-Beruni,” esp. 176–215.

¹¹³ For information, the reader may be deferred to Lettinck, *Aristotle's Physics and its Reception in the Arabic World*; Belo, *Chance and Determinism in Avicenna and Averroes*; Glasner, *Averroes' Physics*; Wirmser, *Vom Denken der Natur zur Natur des Denkens*; Cerami, *Génération et substance*.

al-Fārābī

Particular mention should be made of al-Fārābī. It is known that he wrote several works on natural philosophy and that his works were prominent among Muslim and Jewish authors in Andalusia, such as Ibn Bāǧǧa, Averroes, and Maimonides (d. 1204).¹¹⁴ The bio-bibliographical sources also tell us that al-Fārābī wrote at least one commentary on Aristotle's *Physics* – the *Kitāb Šarḥ al-Samāʿ*, as Ibn al-Qifṭī has it, or *Šarḥ Kitāb al-Samāʿ al-ṭabīʿī li-Aristūṭālīs ʿalā ḡiha al-taʿlīq*, according to Ibn Abī Uṣaybiʿa – and a further work called *Kitāb al-mawǧūdāt al-mutaǧayyira al-mawsūm bi-l-kalām al-ṭabīʿī*.¹¹⁵ As Steinschneider already noted, the latter is a distinct exposition, by and large concerned with Aristotle's argument for the eternity of motion and time from *Physics* VIII.1.¹¹⁶

The nature of the former work, i.e., of al-Fārābī's commentary proper, is more difficult to determine. More than eighty years ago, Alexander Birkenmajer discovered and edited a Latin translation produced by Gerard of Cremona (d. 1187) of a brief outline of Aristotle's *Physics* that is attributed to al-Fārābī under the title *Distinctio super Librum Aristotelis de naturali auditu*.¹¹⁷ This outline cannot by itself be the entire commentary of al-Fārābī, as it is evidently too brief and does not correspond to the arguments and interpretations that are reported in al-Fārābī's name by Ibn Bāǧǧa and Maimonides, for example. Accordingly, and provided the attribution to al-Fārābī is correct, it either was or belonged to a separate treatise, composed in addition to his commentary, or was part of that same commentary.¹¹⁸ If, in turn, Avicenna had access to these works, and in particular to al-Fārābī's commentary on the *Physics*, it is clear that the interpretations they contained must have had tremendous effect on Avicenna – and there is no reason that he should not have had access to them, even though we have no way to determine the precise ways in which they influenced Avicenna.

Indeed, al-Fārābī's influence on Avicenna can be verified at least on one point, viz., regarding the void. A short treatise in which al-Fārābī argues against the existence of the void is extant under the title *Maqāla fī l-ḥalāʾ*, and its influence on Avicenna is

¹¹⁴ cf. M. Rashed, “al-Fārābī's Lost Treatise *On Changing Beings*,” 30; Janos, *Method, Structure, and Development in al-Fārābī's Cosmology*, 38.

¹¹⁵ Ibn al-Qifṭī, *Taʿrīḥ al-ḥukamāʾ*, 279.20f.; Ibn Abī Uṣaybiʿa, *ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ*, vol. 2, 138.26, 139.10 (reading with Steinschneider *al-mawsūm* for *al-mawǧūd*), 140.6; cf. also Maimonides, *Dalālat al-ḥāʾirīn* II.19, 320.22; ḥawāšihī *ʿalā al-Samāʿ*; cf. further Lettinck, *Aristotle's Physics and its Reception in the Arabic World*, 260, 265. Lettinck, however, seems to identify al-Fārābī's commentary with his *Kitāb al-mawǧūdāt al-mutaǧayyira*; cf. also Janos, *Method, Structure, and Development in al-Fārābī's Cosmology*, fn. 60, 38.

¹¹⁶ Steinschneider, *al-Farabi (Alpharabius)*, 20; cf. M. Rashed, “al-Fārābī's Lost Treatise *On Changing Beings*”; Janos, *Method, Structure, and Development in al-Fārābī's Cosmology*, 38.

¹¹⁷ Birkenmajer, “Eine wiedergefundene Übersetzung Gerhards von Cremona.”

¹¹⁸ It has been suggested by Birkenmajer that the outline may be the second half of a physical pendant to al-Fārābī's *Maqāla fī aǧrāḍ al-ḥakīm fī Kitāb Mā baʿd al-ṭabīʿa*, thus indicating the goals and intentions of Aristotle's discourse in the *Physics*; cf. Birkenmajer, “Eine wiedergefundene Übersetzung Gerhards von Cremona,” 474.

unmistakable, as we shall see. In addition, al-Fārābī also composed other works, such as the *Mabādī' ārā' ahl al-madīna al-fāḍila* and the *Kitāb al-Siyāsa al-madaniyya* (also known as *Mabādī' al-mawḡūdāt*). Each of these provides a comprehensive overview of emanation as well as the structure of the material world, yet they treat the topics relevant to the present investigation merely in a wholesale fashion, providing no detailed investigation of such concepts as corporeality and time, for example.

Finally, one further work should be mentioned here, viz., the *ʿUyūn al-masā'il* by Ps.-al-Fārābī. This highly interesting treatise is strongly reminiscent of so many aspects of Avicennian philosophy that it is more likely to have been composed by someone close, or posterior, to Avicenna rather than by someone close to al-Fārābī, by al-Fārābī himself, or in fact by anyone before Avicenna.¹¹⁹

1.3 On Avicenna's Copy of the *Physics*

In the final section of this chapter, I would like to offer some thoughts regarding Avicenna's access to the works that have been mentioned, in particular insofar as his knowledge of the various Arabic translations of both the text of and the commentaries on Aristotle's *Physics* is concerned. It should be borne in mind that none of these translations – with the exception of that produced by Iṣḥāq ibn Ḥunayn – is extant, so that we simply lack a (sufficiently reliable) textual basis for any comparison of, say, the terminology used in Avicenna's works and in the attested Graeco-Arabic translations. Consequently, any attempt at identifying which translation of Aristotle's *Physics* Avicenna used and knew, or maybe even which translation he was primarily working from when he was composing his *al-Samā' al-ṭabī'ī*, is almost necessarily unavailing, so long as no more textual evidence comes to light. Yet, even despite this bleak prospect, some thoughts may indicate a partial answer, at least.

What Did Avicenna Know and What Did He Use?

There is no document informing us about which texts Avicenna used and knew in general, or which translation of Aristotle's *Physics* he was acquainted with in particular. Yet, there is one text informing us that, at the age of seventeen, Avicenna spent six months in the royal library of Nūḥ ibn Maṣṣūr (d. 387/997) in Buḥārā and that it was in this library that he “saw books whose very names are unknown to many and which I

¹¹⁹ cf. Rahman, *Prophecy in Islam*, fn. 2, 21f.; Black, *Logic and Aristotle's Rhetoric and Poetics in Medieval Arabic Philosophy*, fn. 53, 71; Janssens, “The Notions of *wāhib al-ṣuwar* and *wāhib al-'aql* in Ibn Sīnā,” 559; Gutas, “The Study of Avicenna,” 50f.; Janos, *Method, Structure, and Development in al-Fārābī's Cosmology*, fn. 91, 239 and appx. 1; Kaya, “*Ṣukūk alā 'Uyūn*”; for a defence of the attribution to al-Fārābī; cf. Lameer, *al-Fārābī and Aristotelian Syllogistics*, 24f.

had never seen before nor have I seen since.”¹²⁰ This, at least, is what his autobiography tells us. We cannot but take this account seriously, with the result that we are arguably bound to assume that Avicenna, at least at one (early) point in his career, had access to virtually all translations into Arabic that had been produced up to this time, i.e., all those translations of which we know (and maybe more), and this means more or less all translations which have been mentioned in this chapter.¹²¹ Indeed, in light of this testimony from Avicenna's autobiography, the onus of proof seems to be on anyone who intends to argue that Avicenna did *not* know or could *not* have known (and, thus, was not influenced in any way by) a particular book or a particular translation. So, it appears that regarding Aristotle's *Physics*, we are forced to assume that Avicenna may have had access to all Arabic translations that were produced, at least for some limited time at some certain point before he turned eighteen.

This does not necessarily entail that Avicenna also read all texts to which he may have had access within these six months (or even later in other libraries), nor whether he could make copies of some of the works and translations he has read (or was not able to read within these six months), nor which works he had access to only in this library and which he had “ever since” not seen again in any other library, nor how well he, when composing his *al-Samāʿ al-ṭabīʿī*, for example, could remember what he has read more than twenty years earlier. Thus, in a way this tells us all and nothing.¹²²

There is, however, more definite evidence regarding the *Physics*. In his correspondence with al-Bīrūnī and his *Risāla fī aqsām al-ʿulūm al-ʿaqliyya*, Avicenna refers to Aristotle's *Physics* as *Samʿ al-kiyān* and *Kitāb al-Kiyān*, respectively.¹²³ Both of these

120 Avicenna and al-Ġūzġānī, *Sīrat al-šayḥ al-raʿīs*, 36.5f., tr. by Gutas in *Avicenna and the Aristotelian Tradition*, 18; cf. Gutas, *Avicenna and the Aristotelian Tradition*, 169–179. Kraemer describes the same library as “extraordinary” and “wonderful” (*Humanism in the Renaissance of Islam*, 92f.).

121 Taking something seriously is clearly different from taking something for granted or accepting it unconditionally and without qualification.

122 This is especially true with regard to Avicenna's *al-Samāʿ al-ṭabīʿī*. In the preface to *al-Madḥal*, which serves as the universal introduction to the whole of *al-Šifāʾ* and was written by Avicenna's disciple Abū ʿUbayd al-Ġūzġānī, we are told that Avicenna composed the metaphysical and most of the physical parts of his *magnum opus* “without having available any book to consult ... relying solely upon his natural talents” (*al-Madḥal*, preface, 3.1f., tr. by Gutas in *Avicenna and the Aristotelian Tradition*, 32). Yet, al-Ġūzġānī also reports that Avicenna began to write his *al-Šifāʾ* around 411/1020 while being employed by Šams al-Dawla at the latter's court in Hamadān and that he, having begun to work on *al-Samāʿ al-ṭabīʿī*, was able to compose only the first “approximately twenty folia” before he was disturbed by administrative matters, had to go into hiding, and finally even left the area (*al-Madḥal*, preface, 2.14–18). Now, neither is it clear how much was covered by these “twenty folia” that Avicenna was apparently able to write in a promoting environment with sufficient access to books and libraries nor can we be sure about his access to books and libraries afterwards nor even do we know to what extent al-Ġūzġānī's testimony generally is to be trusted; cf. Gutas, *Avicenna and the Aristotelian Tradition*, 109–115, esp. 111.

123 Avicenna and al-Bīrūnī, *al-Asʿila wa-l-aḡwiba*, 18.7; 23.13; Avicenna, *Risāla fī aqsām al-ʿulūm al-ʿaqliyya*, 108.17.

works were composed relatively early in Avicenna's career. In his other – that is to say: later – works he no longer employs this title. One may brave the suggestion that Avicenna's use of this title is a relict of an early acquaintance with a translation that itself bore that title. Consequently, one may think of Sallām al-Abraš's translation of the *Physics* and perhaps also of Ibn Nā'ima's translation of Philoponus' commentary on books V–VIII. Thus, Avicenna may have come to know Aristotle's *Physics* first through one of these two early translations. In light of the fact that Ibn Nā'ima's translation was most probably incomplete, we may prefer to assume that it was the translation by Sallām al-Abraš which introduced Avicenna to Aristotle's *Physics*.

In addition, it is clear that Avicenna was acquainted with materials from Qusṭā's translation, given that he has good knowledge of Philoponus' commentary on the first half of the *Physics*. Whether al-Dimašqī was exclusively interested in Alexander or also in other commentators, and so whether he also revised some of Qusṭā's translation of Philoponus, as he seems to have done with his translation of Alexander's commentary, and, in effect, whether Avicenna, then, used al-Dimašqī's revision or Qusṭā's original, cannot be ascertained. Moreover, Avicenna's general interest in Philoponus' commentary certainly warrants the suggestion that he may have tried to obtain – and, thus, may have known – Ibn Nā'ima's translation of (at least) the second half of Aristotle's *Physics* with the second half of Philoponus' commentary. Regarding Ishāq ibn Ḥunayn's translation, moreover, there is actually no reason that Avicenna should not have had access to it, as it was widely used in philosophical circles of Baḡdād and it would not have been difficult for him to acquire a copy of that translation, given that we have textual evidence testifying to the fact that Avicenna did, indeed, send his associates to Baḡdād to acquire books for him.¹²⁴

However, there are many passages in *al-Samā' al-ṭabī'ī*, in which Avicenna's diction differs from that of Ishāq ibn Ḥunayn (or also of Qusṭā, as far as it is attested or can be reconstructed). Let me just mention four examples. First, at the very beginning of his *Physics*, Aristotle expresses his intention to investigate the “principles or causes or elements” (ἀρχαὶ ἢ αἰτίαι ἢ στοιχεῖα) of natural things. This expression was faithfully translated by Ishāq ibn Ḥunayn as *mabādi' aw asbāb aw usṭuqussāt* (“principles or causes or elements”) but appears in Avicenna as *mabādi' wa-asbāb wa-ʿilal* (“principles and causes and causes”). It is puzzling to read here two different words for “cause” which are often said to be synonymous. There is no reason – at least no *apparent* one – for why Avicenna would have done so.¹²⁵ This passage led Paul Lettinck to assume that Avicenna must have used a translation different from the one produced by Ishāq ibn Ḥunayn.¹²⁶

¹²⁴ cf. Gutas, *Avicenna and the Aristotelian Tradition*, 59f.

¹²⁵ There certainly was a doctrinal reason, as will be explained below, 162ff.

¹²⁶ Lettinck, *Aristotle's Physics and its Reception in the Arabic World*, 97.

Second, in Avicenna's discussion of the definition of nature, he explicitly claims the definition he provided was "taken from" Aristotle (*ma'ḥūd 'an al-imām al-awwal*). Yet, the wording of his definition does not correspond to either Ishāq ibn Ḥunayn or Qusṭā.

Third, Aristotle frequently emphasises in his *Physics* that time "follows" motion and that motion "follows" distance. The term he used in these contexts for "to follow" is a form of the Greek verb ἀκολουθεῖν. Ishāq ibn Ḥunayn translated it with the Arabic verb *taba'a* ("to follow"). A gloss in Ms. Leiden or. 583 attributed to "Yaḥyā," which could be both by Ibn 'Adī or Philoponus but probably refers to the latter, perhaps in the translation of Qusṭā, likewise gives *taba'a*. Avicenna, however, consistently uses forms of the verb *ṭābaqa* ("to conform to") whenever he expresses the same idea.

As a final example, Aristotle states that one of the important conditions of place is that it must be "unmoving" (ἀκίνητον). In fact, he eventually even defines place as an unmoving limit. The expression we find in Ishāq ibn Ḥunayn's translation here is *ḡayr mutaḥarrik*. A gloss in the margins of Ms. Leiden or. 583 which is attributed to "Yaḥyā" uses the expression *ḡayr muntaqil*. Avicenna, who discusses this condition critically and, ultimately, rejects it, as we shall see, uses neither the expression we find in Ishāq ibn Ḥunayn nor the one we find in "Yaḥyā's" gloss (and which may derive from Qusṭā's translation), writing *ḡayr mustabdil*, instead.

Of course there are also numerous passages in Avicenna's *al-Samā' al-ṭabī'ī* which are in line with Ishāq ibn Ḥunayn's terminology or may stem from Qusṭā's translation of Philoponus.¹²⁷ This is hardly surprising, because all the above evidence suggests that there is good reason to believe that Avicenna "possessed" the translations of materials directly relating to the text of Aristotle's *Physics* by Sallām al-Abraš, Qusṭā (and al-Dimašqī), Ishāq ibn Ḥunayn, and perhaps Ibn Nā'ima.¹²⁸ One must also take into consideration that the translators may have rendered certain passages in a similar or even identical way. Yet, on the whole, it seems to be an altogether wrong question to ask, as I have deliberately phrased it above, which translation Avicenna was primarily working from when he was composing his *al-Samā' al-ṭabī'ī*, for most of the time he does not seem to *rely* upon any translation while writing; instead, he puts forth his own philosophy from his own point of view and in the terminology he himself deems most proper. Surely, it is an interesting detail that he has "taken" the definition of nature from Aristotle and that his definition, then, does not correspond to either Ishāq ibn Ḥunayn or Qusṭā, so that, indeed, we may assume that he memorised – or quoted – the definition on the basis of a different translation, i.e., a translation with which he

¹²⁷ Occasionally, I shall refer to some of these passages in my investigation.

¹²⁸ By "possessed" here, I mean that there is no reason that one should deny that Avicenna either once had access to these materials or once has read them or at some point really was in the possession of them. In other words, Avicenna may, throughout his life, well have had *all* major translations at his disposal in one way or another and, thus, could have been influenced by various renderings of the Aristotelian text and different interpretations from the commentaries.

became familiar earlier in his career. So, he may have hit upon the definition of nature in his first read of Aristotle's *Physics* and was impressed by it so much that its particular wording stuck with him. Similarly, the fact that he uses *ṭābaqa* instead of *taba'a* or that he writes *ġayr mustabdil* instead of *ġayr mutaḥarrik* or *ġayr muntaqil* may, likewise, go back to the terminology with which he was primarily familiar through his studies of texts and may, again, testify to a different (i.e., earlier) translation he once was reading. The reason that he wrote *mabādi' wa-asbāb wa-'ilal*, however, instead of something closer to the Greek text as, for example, Iṣḥāq ibn Ḥunayn's *mabādi' aw asbāb aw usṭuqussāt*, is certainly due to doctrinal reasons – and that is: doctrinal reasons of his own philosophy. Thus, in formulating his physical theories, Avicenna did not simply and primarily rely on *one text* or *one translation* which he had on his desk while he was composing his works on nature, constantly looking at it and copying from it. Avicenna was precisely no commentator; he was a philosopher who, in forming his ideas about the world, was certainly influenced by the texts he read but who, in formulating his ideas, was considerably independent.¹²⁹

Clearly, a more comprehensive and systematic investigation and comparison of Avicenna's terminology would be required, in order to determine which translations he used or primarily worked from. Yet, I am sceptical whether any such study would yield a definitive result – in particular, because it would seem to underestimate the independence of Avicenna's reasoning, misunderstand the originality of his thought, and ultimately mistake the essence of Avicenna's philosophical activity.

With this remark, I would now like to turn precisely to Avicenna's natural *philosophy* as it reveals itself in the elements of his physics.

¹²⁹ q.v. also fn. 122 above, 38, as well as below, 73ff.

