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Cover

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

Ibn al-Ṭayyib's Arabic Version and Commentary of Aristotle's De Caelo

Gerhard Endress*

Abstract

Aristotle's cosmological treatise *De Caelo*, appropriately named "Book on the Heaven and the World" in the Arabic tradition, was one of the most influential, and – apart from the *Organon* of logic – the best represented among Aristotle's authentic works in Mediaeval Arabic translations and commentaries. The identity and ascription of the extant versions poses a number of problems which only recently, in the light of manuscript findings and the discovery of some early testimonies, can be solved with certainty. The present contribution, after giving a survey of the translators' work – beginning with Ibn al-Biṭrīq, working in the age of al-Ma'mūn and in the circle of al-Kindī – concentrates on the translation, annotation and commentary of the Baghdad physician and philosopher Abū l-Farağ 'Abdallāh ibn al-Ṭayyib (d. 1043). The transmission, language and interpretation of his *Kitāb al-Samā'*, parts of which have been identified in an acephalous manuscript, and a fragment of his 'Great Commentary', are presented and analysed in detail.

1. The Arabic Versions of Aristotle's De Caelo

1.1. Introduction

Aristotle's *De Caelo* (Περὶ οὐρανοῦ, Arabic, *Kitāb al-Samā' wa-l-ālam*), was translated into Arabic in the early period of the Graeco-Arabic translation movement, in the newly founded capital, Baghdad, due to the eager interest of scientists and administrators of the rising 'Abbāsīd empire in astronomy, astrology, and other disciplines apt to unravel the dependence of the sublunar world from the eternal sphere, and to resolve the antinomy between the eternity of the divine First Cause and the contingency of the created being.

The wide readership and far-ranging influence of the work, from the beginnings of Aristotle's reading in 'Abbāsīd Baghdad to the late revival of the Arabic Aristotle in Šafavīd Iran, is attested in extant translations, in a number of early *testimonia* and quotations supplementing the direct tradition, in *compendia* and literal commentaries, and in new interpretations of the Aristotelian cosmology and physics in the framework of the encyclopaedic *summae* of post-Avicennian philosophy. Compared with the Arabic tradition of other parts of the *Corpus Aristotelicum*, the textual tradition of *De Caelo* is exceptionally rich. Whereas the reading of many Aristotelian texts was superseded through the overwhelming success of Avicenna's *Summae* and later *compendia*, the *De Caelo* continued to be read, or was rediscovered due to the theological interest of its subject matter and the interpretation given to certain concepts by the early translator.

* My sincere thanks are due to Cleophea Ferrari for her careful proofreading and helpful suggestions, and to Cristina D'Ancona and Elisa Coda for their painstaking efforts in editing my manuscript, assisted by Issam Marjani for the Arabic passages – needless to say that all imperfections and blunders that remain are my own!

Our present study is concerned with the extant Arabic versions of *De Caelo*, their origin, dating and transmission, as well as with their identification with regard to the early bibliographical data and the testimonies of the readers and commentators of the text. After an overview of the Arabic tradition, special attention will be given to the translation and commentary of Ibn al-Ṭayyib (d. 435 A.H./1043 A.D.), only recently identified in manuscript, and prepared for critical edition.

Three versions have survived in manuscript:

B The early, ninth century translation of Yahyā (Yūḥannā) ibn al-Biṭrīq from Syriac;

B^C A partial revision of this early version, extending to book I, chapters 1-6, possibly made for the lemmata of Alexander's commentary (v. § 3.1, pp. 223-5);

T A further translation, made independently from Ibn al-Biṭrīq's translation **B** and its partial revision **B^C**, but on the basis of the same Syriac version, has partially survived in a defective codex, Paris BnF 2281, and by internal and external evidence can now be safely attributed to Abū l-Farağ 'Abdallāh ibn al-Ṭayyib, as also the running commentary in the form of marginal scholia accompanying the Aristotelian text (v. § 4).

Since the first from these Arabic versions to become available in print¹ was made on the basis of a single manuscript not of Ibn al-Biṭrīq's original version, but of the partially revised version **B^C** of his translation, and since the translation of Ibn al-Ṭayyib survived only anonymously in an acephalous fragment, initial attempts at identification and dating of the translators were hampered by lack of the relevant materials.² On the basis of numerous manuscripts of version **B** and its revision, transmitted in an Eastern (Iranian) and a Western (Andalusian) tradition, and of a linguistic and structural analysis of the translations, a fairly clear picture has emerged. Taken together with enlightening *testimonia* of some early readers of the work and further fragments of the Arabic versions emerging in recent years, most – if not all – of the questions of the chronology and attribution of the extant versions can now be clarified.

2.1.1. Ibn al-Nadīm and the Bibliographical Tradition

The oldest detailed report on the Arabic translations of Aristotle's *De Caelo* is found in the *Kitāb al-Fihrist* of Ibn al-Nadīm (extant recension dated 377/987):³

Book on the Heaven and the World, in four books. This was translated by Ibn al-Biṭrīq, Ḥunayn revised it. Abū Biṣr Mattā has translated part of the first book. Alexander of Aphrodisias commented on a part of the first treatise of this book.⁴ There is a commentary by Themistius on the whole work,

¹ Aristūṭālīs, *al-Samā' wa-l-Āṭār al-'ulwiyya*, ḥaqqaqahumā wa-qaddama lahumā 'A. Badawī, al-Qāhira 1960 (Dirāsāt islāmiyya, 28).

² See my 1965 thesis, G. Endress, *Die arabischen Übersetzungen von Aristoteles' Schrift De Caelo* (henceforth: *ArÜbCael*), Frankfurt a.M. 1965, printed 1966), where I assumed the version of the Paris ms. to be the oldest one, and called it version A, being misled by the 'modern' terminology of B – in fact, the revised version B^C.

³ M. Steinschneider, *Die arabischen Übersetzungen aus dem Griechischen* [Unveränderter Abdruck der Abhandlungen in: *Beihfte zum Centralblatt für Bibliothekswesen* 5 (1889); 12 (1893); *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 50 (1896); *Archiv für Pathologische Anatomie und Physiologie und für Klinische Medizin* 124 (1891)], Akad. Verlag (repr. Graz 1960), § 29 (53), pp. 55-57; F.E. Peters, *Aristoteles Arabus. The Oriental Translations and Commentaries on the Aristotelian Corpus*, Brill, Leiden 1968 (Monographs on Mediterranean Antiquity), p. 35.

⁴ A. Müller, *Die griechischen Philosophen in der arabischen Überlieferung*, Verlag der Buchhandlung des Waisenhauses, Halle 1873, p. 51 n. 32, followed by Steinschneider, *Die arabischen Übersetzungen aus dem Griechischen* (above, n. 3), § 29 (53), p. 55, states that Abū Biṣr, corrected by Yahyā ibn 'Adī, translated the commentary of Themistius, contaminating Ibn al-Nadīm's note

translated and [and: *v.l.* or, al-Qifṭī] revised by Yaḥyā ibn 'Adī. By Ḥunayn, there is something on this (text),⁵ viz. *the Sixteen Questions*. By Abū Zayd al-Balḥī, there is a commentary on the beginning of this book, "which he wrote" [*add.* al-Qifṭī] for Abū Ġāfar al-Ḥāzin.

Ibn al-Nadīm, *Kitāb al-Fihrist*, vol. 1, pp. 250.28-251.2 ed. G. Flügel; vol. 2, p. 168.1-7 ed. A.F. Sayyid; German trans. by Müller, *Die griechischen Philosophen in der arabischen Überlieferung* (above, n. 4), pp. 18-19; H. Suter, "Das Mathematikerverzeichnis im *Fihrist* des Ibn Abī Ja'qūb an-Nadīm", *Abhandlungen zur Geschichte der Mathematischen Wissenschaften* 6 (1892), pp. 8-9; English trans. by B. Dodge, *The Fihrist of al-Nadīm. A Tenth-Century Survey of Muslim Culture*, Columbia U.P., New York - London, 1970, vol 2, p. 603; cf. Peters, *Aristoteles Arabus* (above, n. 3), pp. 35-6.

This article of the *Fihrist* was adopted verbatim by al-Qifṭī (m. 646/1248) in his *Kitāb Iḥbār al-'ulamā' bi-ahbār al-ḥukamā'* (abridgment by al-Zawzanī, *Tārīḥ al-ḥukamā'*, ed. A Müller - J. Lippert, Dietrich, Leipzig 1903, pp. 39.22-40.5, omitting, however, the words *wa-aṣlahāhū Ḥunayn* ("and Ḥunayn revised it", *sc.* Ibn al-Biṭrīq's version), and concerning the commentary of Themistius, changing *naqalahū wa-aṣlahāhū* (*sc.* Yaḥyā ibn 'Adī) into *naqalahū aw aṣlahāhū*, probably correctly (see below, p. 228). Al-Qifṭī further adds (*ibid.*, p. 40.6-8): "There is a treatise on this book, and a refutation, called *al-Taṣaffuḥ* (*The Scrutiny*), by Abū Ḥašim al-Ġubbā'ī, in which he invalidates the principles of Aristotle".

This is supplemented by Ibn al-Nadīm's notes on the translations of Abū Bišr Mattā (*Fihrist*, p. 264.1-2 Flügel; p. 201.9-10 Sayyid = al-Qifṭī, p. 323.16 Müller-Lippert):

Mattā ibn Yūnus. [...] Among his commentaries [are the following: [...]. Translation of the commentary of Alexander on the *Book on the Heaven* (*naql kitāb tafṣīr al-Iskandar li-kitāb al-Samā'*); Abū Zakariyyā' Yaḥyā ibn 'Adī revised this.⁶

Against the *Fihrist*, p. 250.29-30 Flügel, in this instance the translation of Abū Bišr Mattā is not said to have comprised part of book I only, but the restriction is confirmed by Ibn al-Sarī who had the text before him (see the following section and *infra*, § 3.1.2.2).

2.1.2. Ibn al-Sarī

A valuable supplement to the bibliographer's *Catalogue* – completed, in the extant version, in 377/987H (Ibn al-Nadīm died in 380/990)⁷ – is the testimony of an expert reader of Aristotle's text, the mathematician Abū l-Futūḥ Aḥmad ibn al-Sarī (also known as Ibn al-Ṣalāḥ, d. 548/1153). In his treatise *Explanation of an error occurring in a Proposition mentioned in the Third Treatise of the 'Book on the Heaven and the World'*, he discusses a passage in Aristotle's *De Caelo* III 8, 306 b 3-8, and in order to exclude the possibility that the erroneous statement was "due to a mistake of the translator of this book, viz. Yaḥyā ibn al-Biṭrīq", he proceeds to check on the other translations. He lists – and for the relevant passage, quotes – the following Arabic versions:

on the commentary of Themistius (*Fihrist*, p. 250.30 Flügel) with his information on Alexander's *Tafṣīr* (*ibid.*, p. 264.1-2 Flügel).

⁵ *wa-li-Ḥunayn fihi ṣay'*, see below, § 3.1.2.1, p. 224.

⁶ Cf. above n. 4.

⁷ R. Sellheim, "Das Todesdatum des Ibn an-Nadīm", *Israel Oriental Studies* 2 (1972), pp. 428-32.

the translation of this book made by Abū 'Alī 'Īsā ibn Zur'a,
 the translation of this book by Abū l-Farağ ibn al-Ṭayyib made from Syriac into Arabic,
 the translation of Abū l-Farağ 'Abdallāh ibn al-Ṭayyib from Syriac into Arabic

and then, turning to the commentaries of the Greeks, says:

there is no ancient commentary on this book except the commentary (*ṣarḥ*) of Themistius, found complete,
 and of the commentary of Alexander, a part of his commentary (*tafsīr*) on the first treatise.

Ibn al-Sarī: *Qawl li-l-ṣayḥ Abī l-Futūḥ Aḥmad Ibn al-Sarī fī bayān al-ḥaṭa' al-'arīd fī mā'nā maḍkūr fī l-maqāla al-ṭālīḡa min kitāb al-Samā' wa-l-'ālam*, ms. Istanbul: Aya Sofya 4830, ff. 129a-139b; ed. M. Türker, "İbnü 's-Şalāḥ' in *De Coelo* ve onun şerhleri hakkındaki tenkitleri", *Araştırma* 2 (1964), pp. 1-79, quotations from p. 54.18-25, cf. p. 57.1 (*naql Ibn al-Biṭrīq min al-suryānī ilā l-'arabī*), p. 57.10-11, 57.16-17.

For the 10th/11th century translations not mentioned by Ibn al-Nadīm, his report will be given in full *infra*, § 3.2.1, p. 226f.).

2.1.3 Further Quotations and References

While further revisions and even new versions were made, Ibn al-Biṭrīq's translation remained nonetheless the standard Arabic text of Aristotle's *De Caelo*. The lemmata in Ibn Rušd's *Great Commentary* (*Tafsīr kitāb al-Samā' wa-l-'ālam*) are given in his rendering (v. *infra*, 222 with n. 24, on the Tunis ms. of this work). It is labelled as one of the "translations of al-Kindī" by Ibn Rušd who deplors (*Comm. mag. Cael.* III c. 35) not having one of the superior productions of Iṣḥāq ibn Hunayn (the translator of Aristotle's *Physics* a.o.) at his disposal.

2.1.4 Summary

Aristotle's *De Caelo* is known in the Arabic tradition, both direct and indirect, under the title *Kitāb al-Samā' wa-l-'ālam* (*Book on the Heaven and the World*). The composite title is justified by the contents of the work.⁸ It appears in the same form in the Arabic list of Aristotle's writings of Ptolemy.⁹ But the simple title *Kitāb al-Samā'* is also found in al-Kindī's treatise *On the Number of Aristotle Books* (*R. fī Kammiyyat kutub Aristāṭālīs*, ed. M. Guidi - R. Walzer, p. 111.26 § X.17), and the same form of the title was used by Abū l-Farağ ibn al-Ṭayyib, according to the *explicit* of his commentary on Book II in the surviving fragment (v. *infra*, p. 265).

The Arabic title of Aristotle's Περὶ οὐρανοῦ, *Kitāb al-Samā' wa-l-'ālam* describes very appropriately the subject-matter of the work: the Heavens, meaning the celestial sphere, moving eternally in circular motion (Book I and Book II), and the realm of the earth and the four sublunar elements (Book III and Book IV). It was described in just these terms by the Greek commentators: cf. Philop., *In Meteor.*,

⁸ Some early scholars wondered about a possible confusion or contamination with ps.-Aristotle's *De Mundo ad Alexandrum* (as A. Müller, *Die griechischen Philosophen in der arabischen Überlieferung* [above, n. 4], p. 51, n. 31), but it is clear now that the latter was translated on its own (under the title *K. Aristūṭālīs fī l-'Ālam*). On the Arabic translations of *De Mundo*, v. S.M. Stern, "The Arabic Translations of the Pseudo-Aristotelian Treatise *De Mundo*", *Le Muséon* 77 (1964), pp. 187-204; 78 (1965), pp. 381-93.

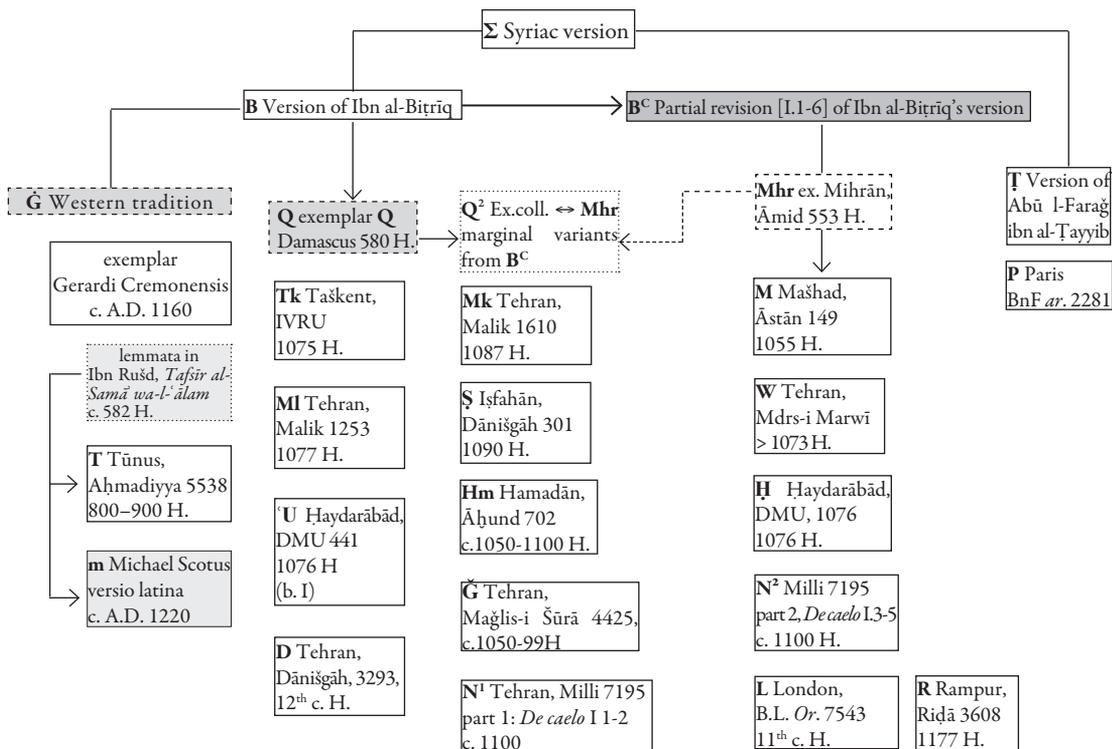
⁹ Abū l-'Abbās Aḥmad ibn Abī Uṣaybi'a, *Kitāb 'Uyūn al-anbā' fī ṭabaqāt al-aṭibbā'*, ed. A. Müller, al-Qāhira / Königsberg, 1882-84, vol. 1, p. 68; al-Qifṭī, *Tārīḥ al-ḥukamā'* [above, p. 215], p. 44; see also P. Moraux, *Les listes anciennes des ouvrages d'Aristote*, Éditions universitaires de Louvain, Louvain 1951, p. 296.

p. 3.30-32 Hayduck (*CAG* XIV.1): οὐρανὸν δὲ τοῖς παλαιοῖς καὶ τὸν ὅλον κόσμον ὀνομάζειν ἕθους, ὡς καὶ Πλάτων “ὃν δὴ οὐρανὸν καὶ κόσμον ἐπωνομάκαμεν” ἐν Τιμαίῳ φησί (*sc. Tim.* 28 B, cf. however Hayduck *ad locum*: “sed magis congruunt quae leguntur *Polit.* 269 D”, cf. also Philop., *In De Gen. et corr.*, p. 1.16-23 Vitelli [*CAG* XIV.2]).

Ibn al-Nadīm knew three Arabic versions of *De Caelo*. We have to regard his testimony against the information provided by Ibn al-Sarī on both the earlier and two more tenth-century translations, based on autopsy. We will examine the identity of the texts mentioned there in comparison with those extant in manuscript.

- A complete translation by Ibn al-Biṭrīq, a *mawlā* of the Caliph al-Ma'mūn, who worked in the circle of the philosopher-scientist al-Kindī, the *ḥaylasūf al-'Arab* (see below, § 2.2). He is the translator of the vulgate version of the book, ascribed to him explicitly in some of the extant manuscripts as well as in the testimony of Ibn al-Sarī.
- A revision (*iṣlāḥ* ‘emendation’) of this translation by Ḥunayn ibn Iṣḥāq. The notice of Ibn al-Nadīm is omitted in al-Qifṭī’s article – who for the rest, copies the whole section faithfully – and is probably to be disregarded, due to a contamination with the mention of Ḥunayn’s *Sixteen Questions* (see below, p. 224, on this text).
- A translation said to comprise only part of the first book, by Abū Biṣr Mattā, and by the same, a translation of the commentary of Alexander on the *Book on the Heaven* (*naql kitāb tafsīr al-Iskandar li-kitāb al-Samā*); “Abū Zakariyyā Yaḥyā ibn ‘Adī revised this”. But “Alexander of Aphrodisias commented on part of the first treatise of this book” only; this is confirmed by Ibn al-Sarī. As we know, Alexander’s commentary was a literal commentary, quoting the lemmata of Aristotle’s text. So Abū Biṣr’s “translation of part of the first book” of Aristotle’s *De Caelo* relates to the lemmata from Alexander’s commentary. We have reasons to believe that this is the partial revision of Ibn al-Biṭrīq’s translation of *De Caelo* Book I, c. 1-6, found in one group of manuscripts (v. § 3.1).
- A translation made from the Syriac by ‘Īsā ibn Zur‘a is mentioned by Ibn al-Sarī. His quotation of *De Caelo* III 8, 306 b 3-8 is the only specimen we have. While made on the basis of the same Syriac text, it is definitely different from Ibn al-Ṭayyib’s, from which the same passage is quoted in Ibn al-Sarī’s comparative examination.
- Abū l-Farağ ibn al-Ṭayyib’s translation is first mentioned, and quoted, by Ibn al-Sarī. Later, Ibn Ruṣd makes use of his version in order to emend the vulgate translation of Ibn al-Biṭrīq, providing the lemmata of his *Great Commentary*. The identification of an acephalous fragment of 62 leaves in ms. Paris, BnF, arabe 2281, with Ibn al-Ṭayyib’s annotated translation was suggested by a number of structural and linguistic details, and supported definitely by the discovery of a piece of his *Great Commentary*, to be presented in the main part of the present study (§ 4).

2.2. The Translation of Ibn al-Biṭrīq



2.2.1. Yaḥyā (Yūḥannā) ibn al-Biṭrīq

Yaḥyā ibn al-Biṭrīq was a prominent figure in the great translation movement, culminating during the reign of the ‘Abbāsīd Caliph al-Ma’mūn. He belonged to the entourage of the vizier al-Ḥasan ibn Sahl who after the assassination of his eminent brother, al-Faḍl ibn Sahl, was appointed vizier of al-Ma’mūn in 202/818 (he died in 236/851)¹⁰ – both the brothers al-Faḍl and al-Ḥasan were among the sponsors of translators and scientists whose support brought riches and advancement to high stations at the court. Our earliest source, Ibn Ḡulḡul’s *Ṭabaqāt* (written in 377/987), calls him a *mawlā* (‘freedman’) of al-Ma’mūn; this would imply his conversion to Islam.

Apart from Ibn al-Nadīm’s testimony of his activity as one of the earlier translators (*Fihrist*, pp. 243.12-244.3 Flügel), notices are devoted to him, and several translations of his are recorded, by Sulaymān ibn Ḥassān Ibn Ḡulḡul (*Ṭabaqāt al-aṭibbā’ wa-l-ḥukamā’*, edited by F. Sayyid: *Les Générations des médecins et des sages*, Publications de l’Institut français d’Archéologie orientale du Caire, Le Caire 1955 [Textes et traductions d’auteurs orientaux, 10], p. 67), al-Qiftī (*Tārīḥ al-ḥukamā’* [as quoted *supra*, p. 215], p. 379 Müller-Lippert – largely dependent on the *Fihrist*); Ibn Abī Uṣaybī’a (*‘Uyūn al-anbā’ fī ṭabaqāt al-aṭibbā’*, vol. 1, p. 205 Müller); Ibn al-‘Ibrī (Barhebraeus) (*Tārīḥ muḥtaṣar al-duwal*, p. 138 Šāliḥānī). See D.M. Dunlop, “The Translations of al-Biṭrīq and Yaḥyā (Yūḥannā) b. al-Biṭrīq”, *Journal of the Royal Asiatic Society* 3/4 (1959), pp. 140-50.

His complete name is Abū Zakariyyā’ Yaḥyā ibn al-Biṭrīq; Ibn Ḡulḡul and al-Qiftī give his *ism* in the form Yūḥannā, corresponding to the Aramaic form of Greek *Ioannes*. The father, al-Biṭrīq,

¹⁰ See D. Sourdél, *Le vizirat ‘abbāsīde*, Inst. Français de Damas, Damas 1959-60, vol. 1, pp. 215-18.

according to Ibn al-Nadīm was active “in the time of al-Manṣūr, who charged him with translating a number of the ancient books” (*Fihrist*, p. 244.3 Flügel). The name al-Biṭrīq is the Greek title of *patrikios*. Ibn Abī Uṣaybi‘a reproduces this information of the *Fihrist*, and adds: “There are many excellent translations made by him, second only to the work of Ḥunayn ibn Iṣḥāq, and I have seen in his translation many medical writings of Hippocrates and Galen” (Ibn Abī Uṣaybi‘a, *‘Uyūn*, vol. 1, p. 205.9-11 Lippert).

The name of the son Yaḥyā is mentioned among those who were sent by the Caliph in quest of Greek manuscript sources into Byzantine territory, along with al-Ḥaḡḡāḡ ibn Maṭar (the translator of Euclid's *Elementa*) and Salm (or Salmā, in the Aramaic form), director of the caliphal library, the *Bayt al-Ḥikma*, and is also listed among the *Asma' al-naqala min al-luḡāt ilā l-lisān al-‘arabī* (“Names of the translators from the [foreign] languages into Arabic”, cf. *Fihrist*, p. 244.1 Flügel), after his father, al-Biṭrīq, and followed by al-Ḥaḡḡāḡ ibn Maṭar and Ibn Nā‘ima al-Ḥimṣī, a member of his circle (see § 2.2.3).

“Yūḥannā was not a physician, but his strength was rather in philosophy” (Ibn Ḡulḡul, *Ṭabaqāt*, p. 67.12 Sayyid; al-Qifṭī, *Tārīḥ al-ḥukamā’*, p. 379.19-20 Müller-Lippert); al-Qifṭī adds: “Above all, he was devoted to translating the works of Aristotle, also – like Ḥunayn and others – the books of Hippocrates” (*ibid.*, p. 379.20-21 Müller-Lippert). Indeed, the list of translations transmitted under Ibn al-Biṭrīq's name or attributed to him in the bio-bibliographical *testimonia*¹¹ contains, beside some medical titles, Plato's *Timaeus* and an important list of *Aristotelica*. Even considering the many uncertainties of attribution and authenticity (see § 2.2.3), we can say that Ibn al-Biṭrīq was the first to translate the works of Greek philosophy on a larger scale, moving – at variance with the astronomers and physicians dominating the scientific community of the early ‘Abbāsīd administration – in a circle of philosopher-scientists: the circle of al-Kindī.

2.2.2. The Syriac Source

Ibn al-Biṭrīq had no Greek. As we learn from Ibn Abī Uṣaybi‘a, “He knew neither Greek nor Arabic properly; he was just a *lātīnī* who knew the language of present-day Byzantium and their script, i.e., the connected letters, not the unconnected of the ancient Greek” – *lātīnī* instead of *rūmī* is unusual, but in respect to language, what is meant must be the Byzantine *koinē*, and the ‘unconnected’ is the uncial majuscule script of the Byzantine codices.¹² Additional evidence of Syriac being the source language of his translation of *De Caelo* and other works is provided by the testimony of Ibn al-Sarī, and by the linguistic evidence of terminology, grammar and style. The restriction to Syriac sources, unsupported as yet by the commentaries of the school tradition, is one of the reasons why some of his translations (as e.g. of Aristotle's *Analytica Posteriora*) were superseded and replaced by those of the translators who in the next generation could rely on the original Greek texts – Ḥunayn ibn Iṣḥāq, Iṣḥāq ibn Ḥunayn, Ṭābit ibn Qurra, Abū ‘Uṭmān al-Dimaṣqī – and then by those of the 10th century, Abū Biṣr Mattā and his school, who, again relying on Syriac sources, revived the teaching curriculum of the Alexandrian school through translations of the Peripatetic and Neoplatonic commentators preserved in the monasteries of Mesopotamia and the Fertile Crescent.

¹¹ A full list, to be complemented and emended in the light of recent research, was compiled by Dunlop, “The Translations of al-Biṭrīq and Yaḥyā (Yūḥannā) b. al-Biṭrīq” (quoted above, p. 218).

¹² Cf. P. Maas, *Griechische Paläographie* (1927), repr. in D. Harlfinger (ed.), *Griechische Kodikologie und Textüberlieferung*, Wissenschaftliche Buchgesellschaft, Darmstadt 1980, pp. 37-59, p. 53f.

No Syriac translation of *De Caelo* has been preserved, nor is any literal translation explicitly quoted by authors writing in Syriac.¹³ It is clear from *testimonia* and internal evidence that both the oldest, early ninth-century Arabic translation of Ibn al-Biṭrīq and the last one by Abū l-Farağ ibn al-Ṭayyib were made from Syriac, and from a comparison of these translations it appears that both were made from the same Syriac *Vorlage* (v. *infra*, § 4.5). But there is no trace of this Syriac version surviving in references or quotations of Jacobite or Nestorian readers, neither in pre-Islamic Syriac literature nor in the learned philosopher-theologians of the church of a later period.

A contemporary of Yaḥyā ibn al-Biṭrīq was Job of Edessa (Ayyūb al-Ruhāwī, called al-Abraṣ ‘the pock-marked’), a philosopher and physician, another translator of Greek works into Arabic, but mostly into Syriac. Hunayn ibn Ishāq, in his *Epistle* on the Syriac and Arabic translations of Galen, names him as translator of 36 works of Galen, among them the *Book on the Theriak*, translated into Arabic by Ibn al-Biṭrīq *from the Syriac of Ayyūb*.¹⁴ Like Ibn al-Biṭrīq, he was active under al-Ma’mūn and died after 832. His *Summa* of natural science and natural philosophy, the *Book of Treasures* (*Ktābā d-Simātā*)¹⁵ reveals an intimate knowledge of *De Caelo* (see ed. Mingana, p. 85 / translation, pp. 16, 86/18, 89/23, 207-8/220-22 – in this place, p. 207/220, an explicit reference – p. 217/239-40, etc. *saepius*). While these references show the author’s familiarity with the Greek work, there is no evidence that he was quoting a Syriac translation available to him, let alone done by himself.

2.2.3. *The Circle of al-Kindī: a Common Agenda, and a Common Language*

Only in the Q family of manuscripts (v. § 2.2.4), “Yaḥyā ibn al-Biṭrīq fatā l-Ma’mūn” is explicitly mentioned as translator of *De Caelo* in the inscription. This is confirmed by the well-informed reader, Ibn al-Sarī, whose quotation from Book III, Ch. 8, corresponds to the text transmitted in manuscript. Taking together the terminology and style of the translation, found as well (a) in other translations of Greek philosophical works under the name of Ibn al-Biṭrīq, and (b) in the works of a group of early translators contemporary with Ibn al-Biṭrīq, and finally, (c) the connection of this group with the ‘Philosopher of the Arabs’, Abū Yūsuf Ya’qūb ibn Ishāq al-Kindī as commissioner, reader and revisor of their translations, we have ample evidence for placing version B of *De Caelo* in the ‘Circle of al-Kindī’.

The coherence of this ensemble of Greek-Arabic translations from the ‘Circle of al-Kindī’¹⁶ can be demonstrated from internal evidence. We have a number of further philosophical works which on the one hand were quoted by al-Kindī or can be shown to have influenced his choice of topics and his doctrine, and which on the other hand – and here textual philology meets the history of ideas – are connected by common features of terminology and style.

¹³ Apart from logic, little has been preserved from the works of Aristotle in Syriac; a meticulous survey of the evidence that can be gleaned from quotations, glosses and indirect transmission has been given by R. Arnzen - Y. Arzhanov, “Die Glossen in Ms. Leyden Or. 583 und die syrische Rezeption der aristotelischen *Physik*”, in E. Coda - C. Martini Bonadeo (eds.), *De l’Antiquité tardive au Moyen Âge: Études de logique aristotélicienne et de philosophie grecque, syriaque, arabe et latine offertes à Henri Hugonnard-Roche*, Vrin, Paris 2014 (Études Musulmanes, 44), pp. 415-63.

¹⁴ Hunayn ibn Ishāq, *Risāla fī dīkr mā turğima min kutub Ġālīnūs bi-ilmībi wa-bā’ d mā lam yutarğam*, ed. with German trans. by G. Bergsträsser, *Hunayn ibn Ishāq über die syrischen und arabischen Galen-Übersetzungen*, Brockhaus in Komm, Leipzig 1925 (Abhandlungen für die Kunde des Morgenlandes, 17.2), pp. 38.19-39.2 no. 83.

¹⁵ Ed. A. Mingana, *Encyclopaedia of Philosophical and Natural Sciences as Taught in Baghdad About A. D. 817, or Book of Treasures, by Job of Edessa*, Cambridge U.P., Cambridge 1935 (Woodbrooke Scientific Publications, 1).

¹⁶ See G. Endress, “The Circle of al-Kindī: Early Arabic Translations from the Greek and the Rise of Islamic Philosophy”, in G. Endress - R. Kruk (eds.), *The Ancient Tradition in Christian and Islamic Hellenism. Studies on the Transmission of Greek Philosophy and Sciences, dedicated to H.J. Drossaart Lulofs on His Ninetieth Birthday*, Research School CNWS, Leiden 1997 (CNWS Publications, 50), pp. 43-76.

The most prolific translator of philosophical works in this group, although not explicitly mentioned in connection with al-Kindī, but quoted by him and linked to other versions by many properties of his language, was indeed Yaḥyā ibn al-Biṭrīq (§ 2.2.1, *supra*, p. 218), who had been a *mawla* of al-Ma'mūn, and whose *nasab*, the Byzantine title of *patrikios*, is a pointer to the Hellenized Christian milieu of the Fertile Crescent.¹⁷ The common characteristics encountered in this group of translations are not shared uniformly by all of them, and not yielding univocal evidence in favour of or against this or that individual translator; what we have is an ensemble of “index fossils”, which may permit us to link a number of texts with each other or with al-Kindī's philosophical and scientific milieu.¹⁸ Best known among the colleagues of Ibn al-Biṭrīq working in this circle are 'Abd al-Masīḥ ibn 'Abdallāh Ibn Nā'ima al-Ḥimṣī who translated an annotated version of several treatise from *Enneads* IV-VI of Plotinus under the name of Aristotle, the famous *Theology* (*Uṭūlūḡiyā wa-huwa l-qawl fi l-rubūbiyya*) “revised by al-Kindī”, and Uṣṭāṭ (Eustathios) who translated Aristotle's *Metaphysics* “for al-Kindī” (*Fihrist*, p. 251.27-28 Flügel).

Closest to *De Caelo* in terminology and style, on the other hand, are the Arabic versions of Proclus's *Elementatio theologica*, likewise transmitted as part of the *Theology of Aristotle*, “excerpted by Alexander Aphrodisiensis”, and like the *Uṭūlūḡiyā*, with many *interpretamenta*, and accompanied by more treatises of Alexander (mostly authentic).¹⁹ From the same milieu, we have an Arabic compendium of Aristotle's *De Anima*, largely dependent on the commentary of John Philoponus.²⁰ Together with the texts mentioned before, these form a group of texts which what has been called the ‘Metaphysics Corpus’ of al-Kindī,²¹ who made good use of the sources provided by his circle.

Notwithstanding the personal and philosophical coherence of the group, we observe differences between the fields of interest and the language of the translations, technique and terminology. Even with regard to the works of Aristotle said to have been translated by Ibn al-Biṭrīq himself, in the manuscripts or in *testimonia*, there remain questions of attribution and identification. Beside *De Caelo*, the translation of Aristotle's *Meteorologica* is under Ibn al-Biṭrīq's name; there are parallels in the terminology, but differences in style – this is not surprising when we regard the character of this version, over long stretches a rough paraphrase or summary rather than a faithful translation (in all probability, due to its Syriac *Vorlage*). Also under the name of Ibn al-Biṭrīq, we find the Arabic version of Aristotle's books *De Animalibus*, but here the language, despite some correspondences, is much closer to the vocabulary and usage of Uṣṭāṭ's translation of the *Metaphysica*. Another close relative of both the Arabic *Metaphysica* and *De Animalibus*, and hence attributable to Uṣṭāṭ, is the translation of Aristotle's *Ethica Nicomachea*, books V to X (as opposed to books I-IV, translated by Ishāq ibn Ḥunayn).²²

¹⁷ Cf. my *ArÜbCael* (above, n. 2), pp. 89ff. I will not go here into the history of the spurious *Kitāb Sirr al-asrār* (*Secretum secretorum*), also attributed to Ibn al-Biṭrīq.

¹⁸ For the principal characteristics and a series of examples see Endress, “The Circle of al-Kindī” [above, n. 16], p. 14], and *infra*, § 4.6, a comparison with the distinctive features of Ibn al-Ṭayyib's translation of the same Syriac version of *De Caelo*.

¹⁹ See G. Endress, *Proclus Arabus: Zwanzig Abschnitte aus der Institutio Theologica in arabischer Übersetzung*, Beirut - Wiesbaden 1963 (Beiruter Texte und Studien, 10) [henceforth: *ProclArab*].

²⁰ R. Arnzen, *Aristoteles' De Anima: eine verlorene spätantike Paraphrase in arabischer und persischer Überlieferung*, Brill, Leiden 1998 (Aristoteles Semitico-Latinus, 9).

²¹ F.W. Zimmermann, “The Origins of the so-called *Theology of Aristotle*”, in J. Krayer et al. (eds.), *Pseudo-Aristotle in the Middle Ages. The Theology and Other Texts*, The Warburg Institute, London 1986 (Warburg Institute Surveys and Texts, 11), pp. 108-240; Id., “Proclus Arabus rides again”, *Arabic Sciences and Philosophy* 4 (1994), pp. 9-51.

²² As shown on the basis of painstaking analytical studies of lexicon, grammar and style by M. Ullmann, *Die Nikomachische Ethik des Aristoteles in arabischer Übersetzung, Teil 1: Wortschatz, Teil 2: Überlieferung, Textkritik, Grammatik*, Harrassowitz, Wiesbaden 2011-2012.

It is probably through al-Kindī's school, where the Neoplatonism of Plotinus and Proclus was received under Aristotle's name, and the authentic writings of Aristotle on cosmology and psychology were given the stamp of gnostic Neoplatonism²³ – thus preparing the integration of the strands of Ancient philosophy through Miskawayh and Ibn Sīnā – that the key texts continued to be read even while new translations became available. Other works of the translator Ibn al-Biṭrīq, as Aristotle's *Prior Analytics*, were superseded and lost without trace. It is true that in many other cases the Arabic Aristotle was simply displaced by the *summae* of Avicenna and survived only when accompanied by commentaries read in their own right (*Physica*, *Metaphysica*). But the *De Caelo* in Ibn al-Biṭrīq's version continued to be read as the vulgate version, even though two complete 10th/11th translations had become available — so Ibn Ruṣd complained that for most of the lemmata of his *Great Commentary* (*Tafsīr al-Samā' wa-l-'ālam*), he had only “the translations of al-Kindī – but more faithful are those of Iṣḥāq”.

2.2.4. The Vulgate Translation of Yaḥyā (Yūḥannā) Ibn al-Biṭrīq: the Witnesses of the Text

The Arabic version **B** made by Yaḥyā ibn al-Biṭrīq has been transmitted in three main groups of witnesses:

a) Western tradition

Ġ The Maghribi tradition of version **B** is represented by one manuscript, preserving the text of Aristotle's *De Caelo* in the lemmata of an incomplete copy (Book I, Ch. 7 – Book II, Ch. 7) of Ibn Ruṣd's *Commentarium Magnum*.²⁴

The Western Arabic tradition is further represented by two medieval Latin translations from Arabic, those of Gerard of Cremona (1114-1187)²⁵, and – in connection with Averroes's *Commentarium Magnum* – by Michael Scot (d. c. 1235).²⁶

b) Eastern tradition

Q A family of several manuscripts, all coming from Iran of the Ṣafavid and post-Ṣafavid periods (11th–13th/17-19th cent.) and going back to an exemplar (now lost) copied in Damascus in 580/1184.

c) A third family of manuscript presents – for book I, ch. 1-6 – a revised version **B^C** of Ibn al-Biṭrīq's original translation:

Mhr All copies, like those of the **Q** family, are from the schools of Ṣafavid Iran and its Indian offsprings, and go back to a common archetype connected with the 6th/12th century Christian physician Mihrān ibn Maṣṣūr. For Book I, Chapters 1-6, this group represents a revised version of Ibn al-Biṭrīq's translation (see the following section).

^{k23} See G. Endress, “Platonizing Aristotle: the Concept of ‘Spiritual’ (*rūḥānī*) as a Keyword of the Neoplatonic Strand in Early Arabic Aristotelianism”, *Studia graeco-arabica* 2 (2012), pp. 265-79.

²⁴ Ms. Tunis, al-Maktaba al-Waṭaniyya, 11821 (c. 8th/14th century. Facs.-ed.: *Sharḥ (Tafsīr) kitāb al-Samā' wa-l-'ālam. Commentary on Aristotle's Book On the Heaven and the Universe*, Facsimile ed., reproduced from ms. 11821, National Library, Tunis, with an introd. by G. Endress, Publications of the Institute for the History of Arabic-Islamic Science, Frankfurt a.Main 1994 (Series C. Facsimile editions, 57).

²⁵ Ed. I. Opelt in *Alberti Magni Opera omnia*, t. V, *Pars 1: De Caelo et mundo*, Aschendorff Verlag, Münster 1971, printed, with a short critical apparatus, in the lower margins of Albert's *De Caelo et mundo*.

²⁶ Ed. in *Averrois Cordubensis commentum magnum super libro De celo et mundo Aristotelis*, ex recognitione Francis James Carmody † in lucem edidit Rüdiger Arnzen, editioni praefatus est Gerhard Endress, Peeters, Leuven 2003 (Recherches de théologie et philosophie médiévales. Bibliotheca, 4).

3. The Revised Version of Ibn al-Biṭrīq's Translation and the tenth-century Translators of *De Caelo* and its Commentators

3.1 The Partial Revision of Ibn al-Biṭrīq's Translation

3.1.1. Transmission

While Ibn al-Biṭrīq's translation became the vulgate version of *De Caelo*, and the basis of all later treatments, a number of manuscripts of Iranian origin offer a revised version of Book I, Chapters 1-6. All the extant copies were transcribed from a common exemplar, going back to the holograph of Mihrān ibn Maṣṣūr al-Masīhī written for the Artuqid Nağm-al-Dīn Alpī in 553/1158. Terminology, style and the quality of this version in regard of accuracy and fidelity point to a revisor who either had access to the Greek text, or revised the translation in the light of commentaries and glosses available in Greek or Syriac.

The Christian physician Mihrān ibn Maṣṣūr ibn Mihrān was working in the service of the Artuqid Nağm-al-Dīn Alpī (r. 548/1154-572/1176) of Diyārbakr.²⁷ For the same ruler, he revised the Arabic version of Dioscurides' *Materia medica*, as appears from the manuscript Mašhad, Āstān-i Quds-i Raḍawī 149, where he is said to have prepared a new version of this work from the Syriac for the Artuqid ruler.²⁸

The revisor of Ibn al-Biṭrīq's version made deep interventions into his predecessor's work only in the first chapters of Book I of *De Caelo*, but even here, he is clearly dependent upon him. He corrects and clarifies the older version – we do not know which additional materials, versions or commentaries were at his disposal (but cf. below on Alexander's commentary) – but from Chapter 5 his changes are becoming less and less. For the rest, he 'modernizes' the terminology, conforming with the technical language introduced by Ḥunayn ibn Ishāq and his group, in particular the philosophical texts translated by Ishāq ibn Ḥunayn, such as Aristotle's *Physica*.

3.1.2. Testimonies and the Question of *Whodunit*

3.1.2.1. Ḥunayn ibn Ishāq

Ibn al-Nadīm, as quoted before, after mentioning Ibn al-Biṭrīq's translation adds that "Ḥunayn revised it" (*wa-aṣlahāhū Ḥunayn*, cf. *Fihrist*, p. 250.30 Flügel). This remark is missing from al-Qiftī's report on *De Caelo*, copied, as all other notices on Aristotle and his works in his *Tārīḥ al-ḥukamā'* from Ibn al-Nadīm's book, with additions and corrections on the basis of his own library and his intimate knowledge of the books available in early 12th century Syria. This omission, and the fact that no other trace is found of a translation of *De Caelo* attributable to Ḥunayn, raises doubts as to the actual contribution of Ḥunayn.

²⁷ Alp-İnanğ Qutlug Bek ibn Timurtaş (Nağm-al-Dīn Alpī), ruler of Diyārbakr 548-572/1154-76. On the Artuqids of Mārdīn and the Amīr Nağm-al-Dīn Alpī v. Cl. Cahen, "Le Diyār Bakr au temps des premiers Urtuqidēs", *Journal Asiatique* 227 (1935), pp. 219-76; C. Hillenbrand, "The Establishment of Artuqid power in Diyār Bakr in the twelfth century", *Studia Islamica* 154 (1981), pp. 129-53 (with genealogical table after p. 154); S. Lane Poole, *Coins of the Urtuqi Turkumāns*, Trübner, London 1875, pp. 24-25 (nos. 29-33).

²⁸ See A. Dietrich, "Eine wenig beachtete arabische Übersetzung der *Materia medica* des Dioskurides", in H.-H. Eulner *et alii* (ed.), *Medizingeschichte in unserer Zeit, Festgabe für E. Heischkel-Artelt und W. Artelt*, F. Enke, Stuttgart 1971; M. Ullmann, *Untersuchungen zur arabischen Überlieferung der Materia medica des Dioskurides*, Harrassowitz, Wiesbaden 2009, pp. 341-55.

Whereas many a translation was wrongly attributed to the famous translator of Greek works, it is doubtful that a version actually revised by Ḥunayn or in his school should not have replaced the older version and put it under his name. It is true that Ḥunayn revised many an older translation, mainly of medical but also of some philosophical sources, into both Syriac and Arabic, and in his *Epistle on the Available Translations of Galen* he lists not a few older versions, Syriac and Arabic, which he revised (*aṣlaḥa*) on the basis of one or more exemplars of the original Greek.²⁹ But it can be excluded that version **B^C** of *De Caelo*, neither extensive nor intensive in detail, should go back to Ḥunayn.

While the mention of Ḥunayn's *Iṣlāḥ* may have been an added gloss in the *Fibrīst*, the mention of a second work by the famous translator, both in the *Fibrīst* and in other sources, may well be authentic, and what is more, can be identified with an extant treatise on *De Caelo*. After giving his information of the translations, Ibn al-Nadīm adds that "by Ḥunayn, there is something on this [*sc. De Caelo*], viz. the 'Sixteen Questions'". Then, Ibn Abī Uṣaybi'a (d. 668/1270), in his lexicon of the *Generations of the Physicians* (cf. '*Uyūn al-anbā' fī ṭabaqāt al-aṭibbā'*', vol. 1, p. 200.1 ed. Müller) lists among the works of Ḥunayn (a) "Summaria of the Book on the Heaven and the world" (*Ġawāmi' kitāb al-Samā' wa-l-ālam*), and then, (b) "Compendium of the comments of the ancient Greeks on Aristotle's book *On the Heaven and the World*" (*Ġawāmi' tafṣīr al-qudamā' al-Yūnāniyyīn li-kitāb Aristūṭālīs fī l-Samā' wa-l-ālam*). These very "Sixteen Questions" on *De Caelo*, indeed constituting a compendium of the cosmological parts of *De Caelo*, Books I and II, are preserved in a Middle Latin version *Liber Celi et mundi*, transmitted under the name of Avicenna, *incipit*: "Collectiones expositionum ab antiquis grecis in libro Aristotelis de mundo qui dicitur celi et mundi".

The Latin *Liber Celi et mundi*, directly dependent on an Arabic original, is attributed to two 12th century translators, Domenicus Gundissalinus of Toledo (d. c. 1190) and Johannes Hispalensis of Sevilla. The late 13th century Hebrew version made by Šlomo ben Moše is clearly derived from the Latin, but reworked, with considerable changes and additions.

The Latin has been edited, and translated into English, by O. Gutman, *Pseudo-Avicenna: Liber celi et mundi, a Critical Edition with Introduction*, Brill, Leiden 2003 (Aristoteles Semitico-Latinus, 14). On the Hebrew version see R. Glasner, "The Hebrew version of *De celo et mundo* attributed to Ibn Sīnā", *Arabic Sciences and Philosophy* 6 (1996), pp. 89-112.

In the sixteen chapters of this book, the author gives a paraphrase of *De Caelo* I.1, I.2, I.3, I.5, I.8, II.1-2, II.4, II.6, II.7, II.8. Chapters 10, 12, 14 and 16 of the ps.-Avicenna are not paraphrases of *De Caelo* texts, but elaborate on related questions of the celestial influence on the sublunar world (so does ch. 16, a simplified account of the nature and qualities of the four elements, but this is quite independent from Aristotle's *De Caelo*).

²⁹ Cf. G. Bergsträsser, *Ḥunayn ibn Iṣḥāq und seine Schule. Sprach- und literaturgeschichtliche Untersuchungen zu den arabischen Hippokrates- und Galen-Übersetzungen*, Brill, Leiden 1913, p. 45; Ḥunayn ibn Iṣḥāq, *Risāla fī ḍikr mā turġima min kutub Ḡālīnūs*, ed. and trans. by G. Bergsträsser: *Ḥunayn ibn Iṣḥāq über die syrischen und arabischen Galen-Übersetzungen* (above, n. 14), p. 39.1, on Galenic texts translated by Ibn al-Biṭrīq. His translation of Plato's *Timaeus* "in three *maqālāt*", probably a paraphrase or epitome, is mentioned in the *Fibrīst* (p. 246.15-16 Flügel = vol. 2, p. 156.9-10 Sayyid) and said to have been revised by Ḥunayn; see R. Arnzen, "Plato's *Timaeus* in the Arabic tradition", in F. Celia - A. Ulacco (eds.), *Il Timeo. Eseggesi greche, arabe, latine*, PLUS, Pisa 2012 (Le vie del sapere. Studi, 2), pp. 181-269. Of Aristotle's *Meteorologica*, first translated by Ibn al-Biṭrīq, Ḥunayn made an independent *Epitome*, v. H. Daiber, *Ein Kompendium der aristotelischen Meteorologie in der Fassung des Ḥunayn ibn Iṣḥāq*, North-Holland Publishing Company, Amsterdam, Oxford 1975 (Aristoteles Semitico-Latinus. Prolegomena et Parerga, 1).

Miguel Alonso,³⁰ relating the subsequent words of the *Fibrist* on the Arabic translations, *wa-li-Ḥunayn fihi šay'* to the preceding mention of Themistius's commentary, instead of to Aristotle's *De Caelo* itself, tried to find evidence in the Latin ps.-Avicenna of extensive use of Themistius's *Paraphrase*. On closer inspection, Gutman confirmed rather close parallels with the ps.-Avicenna in three passages, but these "prove nothing more than that the author of the *Liber celi et mundi* knew of Themistius's work"; for the rest, most of the "quotations" claimed by Alonso simply refer to the content of the *De Caelo* itself. — The identification of the Latin *Liber Celi et mundi* with the "Sixteen Questions" and the *Ḡawāmi'* attributed to Ḥunayn in the Arabic *testimonia* does not rest on the supposed dependance on Themistius, but doubts may be raised.³¹ Whatever the results of further study, it is clear that Ḥunayn is not the revisor of *De Caelo* **B^C**.

3.1.2.2. *Abū Bišr Mattā and the commentary of Alexander*

After Ibn al-Biṭrīq's translation and Ḥunayn's revision, the *Fibrist* names Abū Bišr Mattā as a translator of *De Caelo*: "He translated part of the first book", continuing: "Alexander of Aphrodisias commented on a part of the first treatise of this book", and in the notice devoted to the works of Abū Bišr, mentions that he was the translator of Alexander's commentary as well (v. *supra*, § 2.1.1, *Fibrist*, p. 250.29 and p. 264.1-2 Flügel; the added note, p. 264.2, that Yaḥyā ibn 'Adī revised his version is due to a textual confusion with the information on Themistius's commentary).

This is confirmed by Ibn al-Sarī, *Bayān al-ḥaṭā'* [quoted in full, *infra*, § 3.2.1, pp. 226f.] who still was able to consult "part of the first treatise" (*ba'd al-maqāla al-ūlā*) with Alexander's commentary, but found this irrelevant for his problem concerning the passage in Book III. There is no further trace of Alexander's commentary in the Arabic tradition, except for the quotations found in the commentary-paraphrase of Themistius.

Like most translators of his generation, Abū Bišr Mattā ibn Yūnus al-Qunna'ī (d. 328/940) had no Greek but translated from Syriac into Arabic; still, the wide range of school commentaries at his disposal, translated by himself and his followers, enabled him to arrive at an adequate understanding of the Aristotelian logic, physics, and metaphysics.³² Hence it seems very probable that the revision of Ibn al-Biṭrīq's Arabic version of *De Caelo* is none other than the version found in the lemmata of Aristotle's text translated and transmitted along with Alexander's literal commentary. **B^C** is indeed extending over part of Book I only, and is adapting the technical language of the translation to the standard terminology of logic and physics introduced by the Aristotelian school of Ishāq and by the school of Baghdad founded by himself. In lack of an independent Syriac version of Aristotle, and ignorant of Greek, he made good use of Alexander's commentary for some of the most relevant revisions of Ibn al-Biṭrīq's version.

How did **B^C** find its way into our manuscript tradition, scanty and known from a single strand only? Ibn al-Sarī was active at the Artuqid court in the service of Temür-Taš ibn Īl-Ġāzī (r. 1122-54); Mihrān ibn Manšūr joined his successor Naḡm-al-Dīn Alpī (from 548/1154). It is possible that Mihrān incorporated the revised version of Mattā, found in the lemmata of what was available of Alexander's commentary, and – as we see – still extant in Diyārbakr in his time, into his copy of Ibn al-Biṭrīq's translation, and so constituted the exemplar of the **Mhr** family of manuscripts surviving in 16th century Iran: the sole witness of this branch of the *De Caelo* tradition in Arabic.

³⁰ M. Alonso, "Ḥunayn traducido al latín por Ibn Dāwūd y Domingo Gundisalvo", *Al-Andalus* 16 (1951), pp. 37-47.

³¹ See Glasner, "The Hebrew Version" (above, p. 224), p. 93 and n. 20.

³² See G. Endress, "Mattā ibn Yūnus", in *EI*², s.n., vol. 6, p. 844-6.

3.2. The Tenth-Century Translations of Aristotle and the Reception of the Greek Commentators

3.2.1. The Testimony of Ibn al-Sarī

In a full screening of all the Arabic versions of *De Caelo* available to him, the mathematician Abū l-Futūḥ Aḥmad ibn al-Sarī gives the best and most detailed survey of the Arabic tradition up to the 11th century. In his treatise *Explanation of an error occurring in a proposition mentioned in the third treatise of the Book on the Heaven and the World*, he refutes Aristotle's assumption, put forth in *De Caelo* III 8, 306 b 3-8, that there are two regular solids which can fill up a three-dimensional space, the pyramid and the cube (whereas in a plane, three regular plane figures can fill the space: the triangle, the square, and the hexagon).³³

Ibn al-Sarī, *Qawl li-l-ṣayḥ Abī l-Futūḥ Aḥmad ibn al-Sarī fī bayān al-ḥata' al-'ārid fī ma'nā madkūr fī l-maqāla al-tālīta min kitāb al-Samā' wa-l-'ālam*, ms. Istanbul, Aya Sofya 4830, ff. 129a-139b; ed. M. Türker, "İbnü 's-Şalāḥ'ın *De Coelo* ve onun şerhleri hakkındaki tenkitleri", (quoted above, p. 215-16). — On Aḥmad ibn al-Sarī, a mathematician and physician in the service of the Artuqid amīr Temür-Taş ibn Il-Ġāzī ibn Artuq (ruler of Mārdīn and Mayyāfāriqīn, 516-548/1122-54) who died in Damascus in 548/1158, v. Ibn Abī Uṣaybi'a, *Uyūn*, vol. 2, p. 164 Müller; al-Qifṭī, *Tārīḥ al-ḥukamā'*, p. 279 Müller-Lippert; Suter, *Die Mathematiker und Astronomen der Araber und ihre Werke* (quoted above, p. 215), p. 120; M. Krause, "Stambuler Handschriften islamischer Mathematiker", *Quellen und Studien zur Geschichte der Mathematik, Astronomie und Physik*, Abt. B., Studien 3 (1936), pp. 437-532.

Ibn al-Sarī starts from Aristotle's critique of Plato's *Timaeus*, where he says (*De Caelo* III 8, 306 b 3-9) that "in general, the attempt to give a shape to each of the simple bodies is unsound", and continues that "it is agreed that there are only three plane figures which can fill a space, the triangle, the square, and the hexagon", and only two solids, the pyramid and the cube". After an exposition of the argument, Ibn al-Sarī declares his perplexity at the Philosopher's statement – in fact, cubes only can fill a space. In order to confirm his suspicion, improbable as it might seem, that the Philosopher should have committed a severe blunder "even if entangled in sleep" (*fī l-manām mutayyam*), he first excludes the possibility that it was "due to a mistake of the translator of this book, viz. Yaḥyā ibn al-Biṭrīq", (quoted p. 57.1 as *naql Yaḥyā ibn al-Biṭrīq min al-suryānī ilā l-'arabī*) and proceeds to check on the other translations:

So I looked at the version of this book made by Abū 'Alī 'Isā ibn Zur'a, from Syriac into Arabic, and found the passage to be likewise,

as also the version of Abū l-Faraġ 'Abdallāh ibn al-Ṭayyib, made from Syriac into Arabic.

Hence I turned to the commentaries, especially to those of the Greeks since they are more knowledgeable with respect to the author's intention in this book. As is well known, there is no ancient commentary on this book available except the commentary of Themistius, found complete, and the commentary of Alexander, extant for part of the first book.³⁴ When we looked into the commentary of Themistius, we found that he made a full commentary of the passage, explaining that the fiery substances (*al-nāriyyāt*)

³³ For the problem, cf. Th.L. Heath, *Mathematics in Aristotle*, Clarendon Press, Oxford 1949, pp. 177-8. The first European scholar to notice Aristotle's slip was Josephus Blancanus (Giuseppe Biancani, 1566-1624) in his *Aristotelis loca mathematica* (Bologna 1615).

³⁴ Alexander's commentary is, of course, irrelevant for Ibn al-Sarī's problem because the passage in question occurs in Book III. He confirms Ibn al-Nadīm's statement that only part of Book I of *De Caelo* was translated by Abū Biṣr Mattā (v. *supra*, pp. 214f.).

fill the empty space (*al-fadā'*) in two ways (*'alā waḡhayn*), but these two ways are not valid but are void in face of the principles of geometry.

So I followed up this passage in the Compendium (*ihṭiṣār*) that Nikolaos made of this book, but found that he did not go into the point at all.³⁵ Then we turned to the commentaries of the moderns and their glosses. We found *Quaestiones* presented by Abū 'Alī ibn Zur'a to Yaḥyā ibn 'Adī on this topic, viz. "Why do only two bodily shapes fill the space", and other matters, dependent on the discourse of Themistius in his commentary on this passage, and Yaḥyā ibn 'Adī replied to these questions with answers missing the truth altogether [this is quoted in an Appendix at the end of the treatise, pp. 71-79 Türker].

Likewise, we found that Abū Sahl al-Masīḥī in his *Epitome* of this book missed the point altogether in that he passed over the bodily shapes and replaced them with the corresponding plane shapes.³⁶

Now we looked into this matter in the commentary (*ṣarḥ*) of Abū l-Faraḡ ibn al-Ṭayyib and saw that he quibbled around the comments of Themistius, confounding these with other things of his own, and compounding the error, already mentioned, found in Themistius's commentary and in the [Aristotelian] text. There is another commentary by this Abū l-Faraḡ without the text [i.e. the lemmata] of Aristotle's discourse, in this he reports the error just as in his greater commentary.

Having heard of annotations [i.e. a literal commentary of scholia] by al-Fārābī on this book, dictated to Ibrāhīm ibn 'Adī, I searched for this in the City of Peace [Baghdad] but could not find it, so I obtained a copy from Damascus and consulted the relevant passage, but found that he did not broach the issue and did not add any comment on the matter (Ibn al-Sarī, *Bayān al-ḥaṭā'*, pp. 54.18-55.17 Türker).

Coming to the conclusion that the text was transmitted as it stands in the translations, and might have been added in the Greek, its faulty implications being overlooked out of ignorance by the commentators, Ibn al-Sarī is convinced that the truth of the matter must prevail, true to Aristotle's own precept – *amicus Plato, sed magis amica veritas* (giving a full quotation of *Eth. Nic.* I 4, 1096 a 11-17!). He proceeds with quoting the Arabic translations of 306 b 3-9:

- in the translation of Yaḥyā Ibn al-Biṭrīq from Syriac into Arabic (p. 57.1-9),
- in the translation of Abū 'Alī 'Isā ibn Zur'a from Syriac into Arabic (p. 57.9-15),
- in the translation of Abū l-Faraḡ 'Abdallāh ibn al-Ṭayyib from Syriac into Arabic (p. 57.16-23).

The translation of Aristotle's *De Caelo* by 'Isā ibn Zur'a, a close disciple of Yaḥyā ibn 'Adī and like him a theologian of the monophysite Christian church, is not attested elsewhere; accordingly, Ibn al-Sarī's quotation is the only specimen we have of his version. His version of the commentary of Themistius, on the other hand, is known, but is preserved in Hebrew and Latin only (see next section).

Ibn al-Sarī's information on the translation and comments of Abū l-Faraḡ ibn al-Ṭayyib, and his quotation of an excerpt from his version not preserved otherwise, form a valuable addition to our information on the work of this 10th/11th century physician, philosopher and Nestorian churchman (v. *infra*, § 4.2).

³⁵ The *Epitome* (*muḥtaṣar*) of Nicolaus of Damascus: presumably the one found in his *Philosophy of Aristotle*. See H.J. Drossaert Lulofs, *Nicolaus Damascenus On the Philosophy of Aristotle: Fragments of the First Five Books*, Brill, Leiden 1965 (*Philosophia Antiqua*, 13), pp. 152-65 (ascribed to Nicolaus of Laodicea in recent scholarship).

³⁶ Abū Sahl 'Isā ibn Yaḥyā al-Masīḥī (m. 1010), a Christian physician from Khorasan and one of Ibn Sīnā's teachers in medicine. His *Talḥiṣ kitāb al-Samā' wa-l-'ālam li-Aristū* is extant in the ms. Leiden, Biblioteek der Rijksuniversiteit, *Acad.* 44, no. 4.

3.2.2. *The Commentary of Themistius: Yaḥyā ibn ‘Adī and ‘Isā ibn Zur‘a*

Finally, Ibn al-Sarī quotes Themistius’s commentary-paraphrase on *De Caelo* III 8 in full, and by criticizing his exposition – supporting Aristotle’s statement – point by point, the mathematician proves that cubes only can fill the space.

In order to expose the truth of the matter, even though it should imply contradicting those who first guided us, we shall first establish the text of Aristotle’s words on this matter according to the different translations, and also the text of Themistius in his commentary on this matter (p. 56.12-14 Türker).

The commentary of Themistius is mentioned already by Ibn al-Nadīm:

There is a commentary by Themistius on the complete book that Yaḥyā ibn ‘Adī has translated, or the translation of which he revised (*al-Fibrīst*, p. 250.30 Flügel).

This is clarified by Ibn al-Sarī in his treatise. He states that his commentary was partially translated into Arabic by Abū Bišr Mattā from the Syriac version of Ḥunayn ibn Iṣḥāq and revised by Yaḥyā ibn ‘Adī (p. 56.12-23 Türker), and he adds (p. 68.7-9 Türker): “There is a marginal note (*ḥāšīya*) on this passage, either by the translator, Abū Bišr Mattā, or rather – as it seems to me – by the revisor (*li-l-muṣallih*), Yaḥyā ibn ‘Adī”. We may conclude from these remarks that Yaḥyā ibn Adī did not make a translation of his own, but only revised his teacher’s work.³⁷

The commentary-paraphrase of Themistius (4th century A.D.), the only Hellenistic commentary on *De Caelo* which was available to Arabic authors completely, is known in a Hebrew translation from the Arabic of Yaḥyā ibn ‘Adī (d. 974), made in A.D. 1284 by Zeraḥyā b. Yiṣḥāq b. She’alti’el Hen (Gracian, v. Steinschneider, *Die hebräischen Übersetzungen des Mittelalters und die Juden als Dolmetscher*, Kommissionsverlag des bibliographischen Bureaus, Berlin 1893, p. 125), and translated from Hebrew into Latin by Moses Alatino (16th century).

Ed. S. Landauer, *Themistii In libros Aristotelis De caelo paraphrasis, hebraice et latine. Sefer ha-shamayim we-ha-‘olām le-Aristō ‘im pērūsh Tāmistiūs*, Reimer, Berlin 1902 (*CAG* V.4). — Hebrew translation by Zeraḥyā b. Yiṣḥāq b. She’alti’el, made in 1284, from the lost Arabic version of Yaḥyā ibn ‘Adī, and the Latin translation from the Hebrew by Moses Alatino. New manuscript materials for the Hebrew version described by the late lamented M. Zonta, “*Hebraica veritas*: Temistio, Parafraisi del *De coelo*: tradizione e critica del testo”, *Athenaeum: studi di letteratura e storia dell’antichità* 82, no. 2 (1994), pp. 403-28, notably, the ms. Firenze, BNC, II.II.528, is being used for the new critical edition prepared by Elisa Coda; v. Ead., “Un fragment du commentaire perdu au *De Caelo* d’Alexandre d’Aphrodise sur les différents sens des termes ‘engendré’ et ‘inengendré’ (Thémistius, *In De Caelo*, p. 43.3-44.17 Landauer), *Studia graeco-arabica* 5 (2015), pp. 13-26. A list of quotations from, and references to Alexander has been provided by E. Coda in an appendix to her article “Alexander of Aphrodisias in Themistius’ Paraphrase of the *De Caelo*”, *ibid.* 2 (2012), p. 355-71; see also Ead., “Reconstructing the text of Themistius’ Paraphrase of the *De Caelo*”: the Hebrew and Latin versions on the three meanings of the term ‘heaven’”, *ibid.* 4 (2014), pp. 1-15. — My special thanks are due to Elisa Coda for supplying references and comments based on her forthcoming edition.

In Themistius, Ibn al-Sarī found an exhaustive interpretation of the passage, quoted in full and discussed in the present treatise, but found unsatisfactory in the mathematician’s judgment. Finding the Arabic of the translation maimed by *takalluf kaṭīr wa-ḥurūḡ ‘an madḥab al-‘Arab fi l-kalām*, clumsy and incorrect, he goes on to quote and analyze Themistius’s commentary sentence

³⁷ The passage quoted by Ibn al-Sarī (pp. 58.3-70.1 Türker, interrupted by comments of the author) corresponds to pp. 133.26-134.36 Landauer of the extant Hebrew version (pp. 197.34-199.34 of the Latin version).

by sentence. As a final resource, the mathematician looked into the commentaries and glosses of the “moderns” (*šurūḥ al-ḥadaṯ wa-ta'ālīqihim*): in the first instance, the *Su'ālāt* submitted by Ibn Zur'a to Yaḥyā ibn 'Adī on the question; this is reproduced in full in an appendix to his treatise. In the final analysis, finding all of the commentators missing the mark, Ibn al-Sarī goes on to prove beyond doubt that among the regular solids, only the cube can fill an empty space.³⁸

4. Translation and Commentary of Abū l-Faraġ 'Abdallāh ibn al-Ṭayyib

4.1. Abū l-Faraġ ibn al-Ṭayyib

After the *translatio vetus* of Ibn al-Biṭrīq (and independently of its partial revision **B^C** by a later student of this text), a second version was made by the 10th/11th century physician and philosopher, Abū l-Faraġ 'Abdallāh ibn al-Ṭayyib. One of the last students of the Baghdad school of Christian Aristotelians in the tradition of Mattā ibn Yūnus and Yaḥyā ibn 'Adī, he had studied with Ibn al-Samḥ (d. 1027) and al-Ḥasan ibn Suwār ibn al-Ḥammār (d. 1020), and was appointed chief physician of the Bīmāristān of Baghdad, founded by the Būyid 'Aḍud-al-Dawla. He was also secretary of the Nestorian *katholikos* of Iraq, Elias 1st (*kātib al-Ġātāliq*), and a renowned theologian and historian of the Nestorian church. He died in 435/1043.

G. Graf, *Geschichte der christlichen arabischen Literatur*, Biblioteca Apostolica Vaticana, Città del Vaticano 1944-1953 (Studi e testi), vol. 2, p. 167; see the biography containing a list of his medical and philosophical writings in Ibn Abī Uṣaybi'a, 'Uyūn, vol. 1, pp. 239-41 Müller; a shorter notice: al-Bayhaqī, *Tatimmat Šiwān al-ḥikma*, p. 27 ed. M. Shafī (Lahore 1935) – containing some original material, and treating his relations with his contemporary Ibn Sinā. For a comprehensive biography and a complete inventory of his translations, commentaries and other writings, see C. Ferrari, *Der Kategorienkommentar von Abū l-Faraġ 'Abdallāh Ibn al-Ṭayyib, Text und Untersuchungen*, Brill, Leiden 2006 (Aristoteles Semitico-Latinus, 19), pp. 17-42. See also Ead., “Die Bagdader Aristoteliker, 6: Abū l-Faraġ Ibn al-Ṭayyib”, in *Philosophie in der islamischen Welt, Band 1: 8.-10. Jh.*, hrsg. von U. Rudolph, Schwabe, Basel 2012, pp. 346-52; J. Schacht - M. Meyerhof, *The Medico-philosophical Controversy between Ibn Butlan and Ibn Ridwan*, Egyptian University, Cairo 1937, Index s.n.

In the field of philosophy, he was most active as a commentator of Aristotle, especially of Aristotelian logic; his literal commentaries of Aristotle's *Categoriae* and of Porphyry's *Isagoge* have survived. Only a few of his translations from the Syriac – like his teachers, he had no Greek – are extant, among them ps.-Aristotle, *De Virtutibus et vitiis*,³⁹ but we have a number of his epitomes (called *Ṭimār* ‘collection of fruits’ by the author) of both philosophical and medical Greek texts.

While the list of his writings given in Ibn Abū Uṣaybi'a's 'Uyūn *al-anbā' fī ṭabaqāt al-aṭibbā'* (vol. 1, pp. 240-1 Müller) does not name a commentary or translation of *De Caelo*, a number of *testimonia* witness to the existence and readership of both his version and commentary. What is more, a large fragment of *De Caelo* in an independent Arabic version, preserved in manuscript, can be shown to be his work (a) from the identity of quotations from this version given under his name, (b) from its structural framework and the references given in an accompanying commentary, referring to the author's “great

³⁸ Cf. G. Endress, *The Works of Yahyā ibn 'Adī: an Analytical Inventory*, Reichert, Wiesbaden 1977, pp. 63-4 § 4.52. According to Ibn al-Nadīm, *Fihrist*, p. 264.24 Flügel, Ibn Zur'a wrote a treatise *Ma'ānī qit' a min al-maqāla al-ṭālī'a min k. al-Samā'*; this may have comprised his questions and the comments of his master.

³⁹ *Fī l-Faḍīla*, attributed to Aristotle, and according to ms. Berlin, Staatsbibliothek, Petermann 9 (*Syr.* 88, v. Sachau, *Kat.*, p. 328f. no. 88, no. 25), translated by Ibn al-Ṭayyib from Syriac into Arabic: ed. M. Kellermann-Rost, *Ein pseudo-aristotelischer Traktat über die Tugend. Edition und Übersetzung der arabischen Fassungen des Abū Qurra und des Ibn al-Ṭayyib*, Diss., Erlangen 1965.

commentary' (*tafsīrunā al-kabīr*), and – linking this evidence with Ibn al-Ṭayyib – a fragment of this very 'Great Commentary', closing with the end of Book II where both the title and author are named.

Like other translations and commentaries made by Ibn al-Ṭayyib, the annotated translation of Aristotle's *De Caelo* was divided into lecture units (*ta'ālīm*, the *πρόξεις* of the Alexandrian commentators) and was accompanied (a) by a running commentary, here given in the form of short marginal notes, called *λέξεις* in the Alexandrian cursus, and (b) a *Great Commentary*, i.e. a literal commentary consisting of successive lemmata and *commentaria* (v. *infra*, § 4.7). We may regard this as a hallmark of his method, found in further extant commentaries of this author modelled on the Alexandrian lecture course on the works of Aristotle and other ancient authors, but fallen into desuetude with the transmitters of Graeco-Arabic learning other than himself. An exception is the system of *Prolegomena* and *προτεχνολογούμενα* of the Alexandrian introductions to Aristotle and his individual works, still found in some of the later commentaries and *summae* of Aristotelian philosophy (notably those of Averroes).

It is this structure that provided the first hint for identifying the fragmentary, acephalous text of the unique codex with Ibn al-Ṭayyib's translation, mentioned and quoted in a number of *testimonia*. Certain peculiarities of the translation on the one hand, and the discovery of an authored fragment of Ibn al-Ṭayyib's *Great Commentary*, helped to confirm the identity of the extant text with the work of the 10th/11th century Aristotelian scholar, and to make a new assessment of his influence.

4.2. Testimonies and Quotations

4.2.1. Memorandum of a Disciple of Ibn Sīnā

During the sack of Isfahan by the troupes of Ma'ūd of Ghazna in 1034, Ibn Sīnā lost the manuscript of his yet unfinished *Insāf*, as well as most of his library. One of his pupils offered to buy for him the books of the Baghdad Aristotelians in order to furnish the basis for recovering the sources necessary for reconstructing his work. A detailed *Memorandum* is preserved in ms. Oxford, Bodl. Hunt. 534, ff. 13bult.-15b2 (preceding Ibn Sīnā's *Mubāḥaṭāt*), giving a list of the works obtained:

These books [by Ibn al-Ṭayyib] that became available to us are those which he composed on the *Eisagoge* [of Porphyry], *Categories*, *De Interpretatione*, *Sophistici Elenchi*, *De Caelo*, *De Sensu et sensato*, and *Metaphysics*.

Translation and commentary by D. Gutas, *Avicenna and the Aristotelian Tradition. Introduction to Reading Avicenna's Philosophical Works. Second, Revised and Enlarged Edition, Including an Inventory of Avicenna's Authentic Works*, Brill, Leiden 2014, 2015², p. 69.

4.2.2. Ibn al-Sarī

Detailed informations on Ibn al-Ṭayyib's work on the *De Caelo*, and excerpts from his translation, are given by the mathematician Ibn al-Sarī, as quoted in full *supra*, § 3.2.1. Apart from the Arabic translation of the Aristotelian text, he knew both a long and a short commentary on *De Caelo* by Ibn al-Ṭayyib.

4.2.3. Ibn Rušd, Averroes, *Comm. mag. in Aristotelis De Caelo*

In his *Great Commentary* (*Tafsīr*, also *Šarḥ*) on *De Caelo*, finished near the end of his life, Ibn Rušd deplores that for this important work he had only one of the old translations from the school of al-Kindī at his disposal (Averrois Cordubensis *Commentarium Magnum super libro De celo et mundo Aristotelis* (above, n. 26), liber III, c. 35.6, p. 567 Carmody-Arnzen). Still, in some cases, where Ibn al-Biṭrīq's translation baffled him, he took recourse to an alternative version.

a) *De Caelo* III 6, 304 b 21-30 (according to Ibn al-Biṭrīq's Arabic version, pp. 338.15-339.9 Badawī):

"We want to inquire first whether the elements are of infinite duration and eternal, or generated and falling under destruction. (...) We say: It is impossible that the elements should be eternal. For we see that fire and water and each of the simple bodies dissolve and decompose, but either this dissolution and decomposition is infinite, or it must stop. Now we say, if the dissolution should be infinite, the time of dissolution will be infinite as well, and also the time of composition [read. *al-tarkīb*] will be infinite, because every part of the parts of the element will dissolve at one time and will be composed at another time" (*etc.*, leading to the absurdity of two concurring processes of infinite duration).

In Ibn Rušd's text, the second part of the disjunction *li-anna kulla ġuz'in min aġzā'i l-uṣtuqussi yanḥallu fi zamānin āḥara wa-yatarakkabu fi zamānin āḥara* was omitted through homoeoteleuton, in the textus as well as in the lemma quoted in the commentary. The integral text was found "in the translation of Abū l-Faraġ".

- Averroes, *Comm. magnum in De Caelo*, III comm. 52, p. 599.83-88 Carmody-Arnzen: Deinde dixit Quia omnis pars elementi dissolvitur in alio tempore, idest illud quod corrumpitur corrumpitur in alio tempore ab eo in quo generatur, scilicet quod illud de quo dicitur quod iam corruptum est postquam fuit: **in translatione Albufarage** est scriptum "quod omnis pars elementi corrumpitur in tempore, et generatur in alio"; et hoc non indiget expositione.

b) *De Caelo* III 7, 305 a 33 - b 5. In his discussion of the theories about the way in which one element may come forth from another (ὁ τρόπος τῆς ἐξ ἀλλήλων γενέσεως), Aristotle first refutes Empedocles and Democritus. If generation is the 'coming out' of a simple body from another (ἐνυπάρχον ἐκκρίνεσθαι), it is an illusion.

305 b 3-5 (οἱ περὶ Ἐμπεδοκλέα καὶ Δημόκριτον) ποιοῦντες (...) φαινομένην γένεσιν· ἐνυπάρχον γὰρ ἕκαστον ἐκκρίνεσθαι φασιν, ὥσπερ ἐξ ἀγγείου τῆς γενέσεως οὔσης, ἀλλ' οὐκ ἔκ τινος ὕλης, οὐδὲ γίγνεσθαι μεταβάλλοντος. ("If generation is an excretion of one body from another, as they say, generation is an illusion. They make it a process of excretion from a body of what was in it all the time-as though generation required a vessel (ἀγγεῖον) rather than a material-so that it involves no change of anything", trans. Stocks).

Arabic (Ibn al-Biṭrīq's version, as read by Ibn Rušd):

Lākinnahum aṭbatū bi-dālīka kawnan mumawwahan, wa-dālīka annahum qālū inna l-uṣtuquṣṣāti kāminatun ba'ḍuhā fi (*v.l.* min) ba'ḍin, wa-innamā kāna ba'ḍuhā min ba'ḍin ka-zuhūri (*v.l.* li-zuhūr) ba'ḍihā min ba'ḍin, ka-anna l-kawna inā'un (*v.l.* innamā) taḥruġu minhu l-ašyā'u wa-taḥzharu, lā anna l-ašyā'a takūnu min 'unṣurin-mā bi-stiḥālatin wa-taġayyurin.

Averroes, *Comm. magnum in De Caelo*, textus III.56, p. 610.7-11 Carmody-Arnzen, in Ibn Rušd's lemma (trans. Michael Scotus):

Sed ipsi confirmant per hoc generationem sophisticam: dixerunt enim quod elementa sunt clausa exinvicem et egredientia exinvicem, sicut facere filios, et quod generatio non est nisi (*innamā*) exitus rerum, {sicut ignis a lapide apud impulsionem}, neque quia res generantur exinvicem secundum transmutationem et alterationem.

Latin, trans. Gerardus Cremonensis (p. 233.75-78 Opelt):

Verum ipsi affirmaverunt per illud generationem fallacem; quod est, quoniam ipsi dixerunt, quod elementorum alia sunt occultata in aliis et sunt egredientia alia ex aliis, sicut ortus et partus, et ex generatione quidem non egrediuntur res et apparent, {sicut ignis ex lapide apud percussionem}, quoniam res generantur ex materia sua per alterationem et mutationem.

The example “sicut ignis a lapide apud impulsione” (“like fire from a stone when it is struck”), is missing in the Arabic codices of Ibn al-Biṭrīq’s version, and probably goes back to a gloss in the Western tradition; as Averroes rightly remarks, it does not fit the context (generation by excretion). For a better example, he turns to Abū l-Farağ ibn al-Ṭayyib’s translation:

- Averroes, *Comm. magnum in De Caelo* III, comm. 56, p. 612.68-80 Carmody-Arnzen: Et dixit Secundum alterationem et transmutationem, quia sic est generatio apud dicentes generationem esse in capitulo translationis non in capitulo transmutationis, et exitus ignis a lapide est ex capitulo alterationis et transmutationis; et tamen induxit exemplum de eo quoniam apparet, et non est ex capitulo translationis. Et **in translatione Albefarag** est aliud exemplum nobilius, et est illud: dicunt enim quod elementa sunt clausa adinvicem, et non generantur exinvicem nisi secundum apparentiam eorum abinvicem, ita quod generatio non est nisi exitus rerum, sicut exitus eius quod exit a vase, non quod generentur exinvicem secundum alterationem. Et hoc est intellectum per se, sed videtur quod iste vir non transtulit nisi secundum intentionem, non secundum verba.

The “preferable example” (probably, *miṭāl afdal*) of excretion of one body from another turns out to be a faithful rendering of the Greek ἀγγεῖον, Arabic *inā’* (Latin, *vas*); this figures in Ibn al-Biṭrīq’s translation as well, but was misread (إنما) by the transmitters of most branches of the manuscript tradition. — Being unaware of the textual corruption, Averroes praises Ibn al-Ṭayyib’s translation for being faithful to the intention, not sticking to the words.⁴⁰

c) *De Caelo* III 7, 305 b 10-20. While according to Aristotle generation is the change (μεταβολή) of some matter into what is generated, he rejects the view of Empedocles that a simple body is coming out of another body as if the latter were a vessel (305 b 4-5 ἐνυπάρχον ἕκαστον ἐκκρίνεσθαι φασιν, ὥσπερ ἐξ ἀγγείου τῆς γενέσεως οὔσης).

305 b 10-20 Ἐτι δὲ τῶν μεμιγμένων σωμάτων οὐκ ἀνάγκη χωρισθὲν θάτερον αἰεὶ πλείω τόπον ἐπέχειν· ὅταν δ’ ἐξ ὕδατος αἴρ γενήται, πλείω καταλαμβάνει τόπον· τὸ γὰρ λεπτομερέστερον ἐν πλείονι τόπῳ γίγνεται. Φανερόν δὲ τοῦτό γε καὶ ἐν τῇ μεταβάσει· διατμιζομένου γὰρ καὶ πνευματουμένου τοῦ ὑγροῦ ῥήγνυται τὰ περιέχοντα τοὺς ὄγκους ἀγγεῖα διὰ τὴν στενοχωρίαν. Ὡστ’ εἰ μὲν ὅλως μὴ ἔστι κενὸν μηδ’ ἐπεκτείνεται τὰ σώματα, καθάπερ φασὶν οἱ ταῦτα λέγοντες, φανερόν τὸ ἀδύνατον· εἰ δ’ ἔστι κενὸν καὶ ἐπέκτασις, ἄλογον τὸ ἐξ ἀνάγκης αἰεὶ πλείω τόπον ἐπιλαμβάνειν τὸ χωριζόμενον (Trans., based on Stock and Kouremenos: “Again, when one of the bodies that are mixed is separated, there is no reason why it should always take up more space, but when air is generated from water, it occupies more space, since the finer body takes up more space. This is obvious also in any case of transformation. As the liquid is converted into vapour or air the vessels which contain it will burst due to lack of space. Now, if there is no vacuum at all, and if, as those who take this view say, there is no expansion of bodies, the impossibility of this is manifest; and if *vacuum* does exist and expansion does occur, there is no accounting for the fact that the body which separates out occupies of necessity a greater space”).

Ibn al-Biṭrīq’s translation, used by Ibn Ruṣd for the lemmata of the *Commentarium magnum*:

“We say further that the bodies mixed with one another, when one is separated from the other, it will not take more space than its other space (*sc.* in the state of mixture) necessarily. But the air, when it is generated from water, takes more space than it took in the first instance, and that is because the finer body is in (*min* : *leg. fi*) a greater space. Now this is evident and clear in [a process of] transformation and change (*fi l-istihāla*

⁴⁰ Ferrari, *Der Kategorienkommentar von Abū l-Farağ ‘Abdallāh Ibn al-Ṭayyib* (quoted above, p. 229), pp. 26-7.

wa-l-nuqla): when moisture evaporates and becomes hot, the containing vessel bursts and comes apart due to its becoming too narrow for it. If this is the case, and if there is no void and no vacuum at all into which it would expand and spread out – as the advocates of latency (*kumūn* ‘inherence’ of a body in another) say –, it is clear and manifest that it is impossible that the body takes up more space than its [own] space *when it appears and comes out. But when void and vacuum do exist, and expansion and spreading out, it is absurd that the body separating out from another body, should occupy more space than its former space*”.

305 b 19 ἀεὶ : om. Ar^B

Averroes, *Comm. magn. in De Cael.*, text. III.58, p. 610.1-11 Carmody-Arnzen (trans. Michael Scotus):

Et dicamus etiam quod corporum miscibilium cum separatur unum ab altero, non occupat maiorem locum altero necessario. Aer autem, cum fuerit ex aqua, occupat maiorem locum suo priori, corpus enim subtilius est in maiori loco. Et hoc manifestum est in alteratione et translatione, quoniam cum humiditas fuerit vapor et inflatur, extendit vas continens ipsum, et frangitur cum non possit ei sufficere vas. Et cum ita sit, et nihil est vacuum in quo expandantur corpora, sicut dicunt facientes latitationem, manifestum est quod impossibile est ut corpus recipiat maiorem locum suo primo loco.

Omitting the last part of the Arabic lemma (in italics in our quotation), corresponding to 305 b 18-20 εἰ δ' ἔστι ... χωρίζομενον, due to homoeoteleuton.

- Averroes, *Comm. magnum in De Caelo*, c. III, p. 58.39-56 Carmody-Arnzen: Deinde dixit Et cum ita sit, et nihil est vacuum, potest intelligi: Et si generatio non est nisi exitus ab aere, et universaliter corporis subtilis a subtili, et impossibile est vacuum esse in quo corpora expandantur et transferantur ex magnitudine in parvitatem, cuius expansionis causa apud facientes latitationem sit vacuum, manifestum est quod impossibile est ut idem corpus cum transfertur occupet ampliorem locum quam ante; et si concesserimus eis vacuum esse, non est possibile eis dicere etiam quod cum corpus latet, est minus, et cum apparet est maius; sed Aristoteles pertransiit hanc partem divisionis et verificat hanc expositionem, quia hoc videmus propalatum **in translatione Albefarag**. Dixit enim:

Et cum ita sit, et nihil est vacuum omnino in quo corpora expandantur, manifestum est quod est impossibile ut occupent maiorem locum primo cum exierint et apparuerint; et si fuerit vacuum cum quo adaptatur expansio, impossibile est ut corpus occupet maiorem locum suo primo loco cum separatum fuerit ab alio corpore (min mawḍi'ihī idā mā zahara wa-haraġa), idest quod impossibile contingit huic positioni sive concessum fuerit vacuum esse et quod est causa transmutationis corporis ex magnitudine in parvitatem, sive non.

Ibn Rušd found the full text of Aristotle's two-sided argument against the advocates of generation by excretion in Ibn al-Ṭayyib's version only.

4.2.4. Quotations from Ibn al-Ṭayyib's Translation in the Manuscript Family Q of version B

a) The Eastern group of manuscripts presenting Ibn al-Biṭrīq's version replaces the text corresponding to *De Caelo* I 7, 275 a 28 – b 2 ὑποκείσθω ... διήρηται, probably due to omission through homoeoteleuton in the standard version B, by a different translation. Here, both the Ḥaydarābād and Iṣfahān mss. add in the margin (ms. 'U 441, f. 23a; ms. S, f. 18b):

hādihī l-ḥutūt wa-l-ḥurūf 'alā mā ṭabata fi naql 'Abdallāh ibn al-Ṭayyib kātib al-Ġāṭaliq.

These lines and the letters [representing them, *sc.* in the mathematical proofs] correspond to those established in the translation of 'Abdallāh ibn al-Ṭayyib, secretary of the Katholikos.

The terminology conforms with Ibn al-Ṭayyib's usage: *ġism* for σῶμα against Ibn al-Biṭrīq's *ġirm*, *mutanābī* for πεπερασμένον against *dū nihāya* in the context of version B, *ḥasbu* for μόνον against *faqat*.

b) Also in the **Q** family of manuscripts of Ibn al-Biṭrīq's translation, the transliterated term *abūfāsīs* for Greek ἀπόφασις is replaced by the Arabic term *naqīd* in I. 12, 282 a 4, 7, 10. In other instances, I 12, 281 b 33 and 282 a 6, *abūfāsīs* has been left unchanged. Then at 282 a 14, where the Arabic *abūfāsīs* is taken from the context but has no verbal equivalent in the Greek, a marginal note in ms. Ḥaydarābād 441 (f. 41b) explains that this is replaced by *naqīd* in Ibn al-Ṭayyib's version – this is indeed the case, as can be seen from the extant part in ms. **P**:

naql al-šayḥ Abī [sic] l-Farağ k̄atib al-Ġātaliq [‘U: al-samā yaliq] ‘awwaḍa fī l-muntasah ‘naqīd’ wa-huwa l-šaḥīḥ li-annahū innamā arāda l-salb.

The translation of the *šayḥ* Abū l-Farağ, secretary of the Katholikos, has replaced this in [the reading of] the exemplar (*muntasah*), by *naqīd* (opposite), and this is correct, since indeed he means the negation.

Ms. Iṣfahān 301 (f. 36b) has a similar gloss at this place, but the copyist misunderstood the reference to Ibn al-Ṭayyib's change in terminology:

naql al-šayḥ Abū [sic] l-Farağ k̄atib al-Ġātaliq ‘awwaḍa ‘didd’: ‘naqīd’, wa-huwa l-šaḥīḥ li-annahū innamā arāda l-salb.

The translation of the *šayḥ* Abū l-Farağ [...] has replaced ‘*didd*’ by ‘*naqīd*’, and this is correct [etc.].

c) In the manuscript family of version **B^C** (v. §3.1.1), a group of Iranian manuscripts going back to a common subarchetype **Mhr** and best represented by ms. Mašhad, Āstān 149, a lengthy passage translating *De Caelo* I 2, 269 a 2-18, missing from the copyist's exemplar, has been supplied from a different version, but not explicitly attributed to one of the translators. The terminology would not exclude Ibn al-Ṭayyib.

4.3. The Manuscript

4.3.1. General Description and Contents of the Manuscript

P Paris, Bibliothèque Nationale de France, fonds arabe 2281.

Ancien fonds 597; v. W. MacGuckin de Slane, *Catalogue des manuscrits arabes*, Impr. nationale, Paris 1883-95, pp. 399-400 — URL of digital reproduction: <http://gallica.bnf.fr/ark:/12148/btv1b525084694/>.

148 folia, 18/19×5/9 cm. 19th century red leather binding, with embossed stamp of the Bibliothèque royale. A multi-text manuscript bound up of four parts written by different hands, with an added title and colophon. The fictitious title f. 1a, *Silsilat al-tawārīḥ* and *incipit*, and the apocryphal *colophon* f. 148, written by the same coarse hand, were fabricated in order to convey the appearance of a single, complete work, giving (f. 148) 488/1095 as the alleged date of completion. The second piece contains a reading note (*qirā'a*) dated 596/1199-1200.

- fol. 1a. *Silsilat al-tawārīḥ* [fictitious title on an added leaf before the acephalous treatise beginning on f. 2a, and corresponding to a *colophon* added at the end of the volume, f. 148]. *Inc.* f. 1b1-6: “ḥādā kitāb fihi silsilat al-tawārīḥ wa-l-bilād wa-l-buḥūr wa-anwā‘ al-asmāk wa-fihi ‘ilm al-falak wa-‘ağā’ib al-dunyā wa-qiyās al-buldān wa-l-ma‘mūr minhā wa-l-waḥš wa-‘ağā’ib wa-ğayr dālīka wa-huwa kitāb nafīs”.
- ff. 2-56. [*Aḥbār al-Šīn wa-l-Hind*] The first part written by Sulaymān ‘the Merchant’ or summarized from his accounts (as indicated by a reference fol. 6a10); the second part a supplement by Abū Zayd al-Ḥasan al-Sīrāfi. Ed. as *Silsilat al-tawārīḥ* by Eusèbe Renaudot: *Anciennes Relations des Indes et de la Chine, de deux voyageurs Mahometans, qui y allèrent*

dans le neuvième siècle, Coignard, Paris 1718; re-ed. under the title *Ahbār al-Šīn wa-l-Hind*, with new translation by Joseph Toussaint Reinaud, *Relation des voyages faits par les Arabes et les Persans dans l'Inde et à la Chine dans le IX^e siècle de l'ère chrétienne*, texte arabe imprimé en 1811 par les soins de feu [Louis-Mathieu] Langlès, publié avec des corrections et additions et accompagné d'une traduction française et d'éclaircissements par M. Reinaud, 2 vols., Imprimerie royale, Paris 1845; further ed., trans. by Jean Sauvaget, *Ahbār al-Šīn wa-l-Hind: Relation de la Chine et de l'Inde*, rédigée en 851, Les Belles Lettres, Paris 1948.

f. 6a10. Quoting Sulaymān al-Ṭāġir.

f. 23b. *Expl.*: “tamma l-kitāb al-awwal”. [Followed by reading note:] “naẓara fī ḥādā l-kitāb al-faḳīr Muḥammad fī sanat 1011 [A.D. 1602]”.

f. 24a. *al-Kitāb al-ṭānī fī ahbār al-Šīn wa-l-Hind. Inc.*: “Qāla Abū Zayd al-Ḥasan al-Sīrāfī: innanī naẓartu fī ḥādā l-kitāb ya'nī l-kitāb al-awwal alladī umirtu bi-ta'ammulihī wa-iṭbāt mā waqaftu 'alayhi [...] fa-waġadtu ta'riḥ al-kitāb fī sanat sab' wa-ṭalāṭin wa-mi' atayn (237/851)”.

f. 56a. Collation note dated Šafar 596/1199-1200.

- 2, fol. 57. Table, in *dīwānī* numerals, of the dimensions of several fortresses of Syria. In fact, this is part of the following piece:
- 3, fol. 58-62. “Misāḥat al-bilād al-ġāriya fī mulk [...] Nūr al-Dīn ibn Zankī fī sanat arba' wa-sittīn wa-ḥamsimī'a”. *Memorandum* written in 544 H. (1169 A.C.), shortly after the death of the sultan Nūr al-Dīn ibn Zangī, on the dimensions of several fortresses guarding the dominions of the dynasty, noting the distances between one fortress and the next.
- 4, foll. 63-124. Acephalous fragment of an Arabic version of Aristotle's *De Caelo*, with marginal commentary.
- 5, foll. 125-147. An acephalous treatise, beginning with the second leaf of the introduction, on the anatomy and usefulness of the parts of the human body, in form of questions and answers. The extant part treats the hand and the arm. A very concise catechism, only remotely dependent on Galen's *De Usu partium*. The paper and the scholarly handwriting (with sparing use of diacritical marks) point to an early, 11th-12th century dating of the ms.
- 6. The *explicit*, fabricated by the scribe of the fictitious title and *incipit*, is dated 488/1095.

4.3.2. Description of the De Caelo part of the manuscript

- foll. 63-124. Seven quires from a paper codex of considerable age. Collation notes (*muqābala*) occur at several instances (fol. 112b at the beginning of the 13th *ta'lim*, item 106b beside the intermediate title of the 16th *ta'lim*: “*balaġat al-qir[ā'a] wa-muqābalat al-dustū[r]*”), but are not dated.

See G. Vajda, “Manuscrits arabes de la Bibliothèque Nationale. I. Fragments d'une traduction arabe du *De Caelo* d'Aristote”, *Revue des études islamiques* 16 (1948), pp. 89-92.

Paper, cut and writing of the relevant part of our ms. differ from the remaining pieces bound up into the volume. Being larger than other pieces bound up with it, the block was cut down by the bookbinder in order to make it fit the size, leading to some textual losses due to close trimming where the marginal comments were continued into the upper and lower margins. In the course of a recent restoration of the ms. in 1980, when a number of damaged areas were covered with transparent tape, and the volume was rebound, some passages still readable in a microfilm prepared in the late 1950s were effaced, and some of the comments written on the inner margins close to the fold were concealed.

The *De Caelo* part is written in a meticulous scholarly *nashī*. The main text of Aristotle's work is written in fairly large, bold letters, and accompanied by marginal comments in smaller script in a column to the left of the main text. It is divided into larger units (*ta'lim*, see below) and smaller pericopes of text followed by summary comments, set off by centered titles *Qāla Aristūṭālis* and *Qāla l-mufasssīr*. Each phrase bearing an annotation closes with a dotted triangle ❖, establishing the correspondence with the marginal comments (*ta'ālīq*).

The text is mostly unvocalized (but *tanwīn* for *ḡarr* and *naṣb*, as also *šadda*, are occasionally provided), with punctuation being used sparingly, but given wherever ambiguity may occur, and with frequent *mubmal* signs added to letters *ḥ*, *r*, *s* and *ṭ*. Less familiar words and formations are fully vocalized in some rare cases (as fol. 111a: *yuharrimahū*). According to Middle Arabic usage, *hamza* is not noted in final position (*šay*, *samā*) and in the middle of words (*dāyim*).

4.3.3. Inventory of De Caelo texts

The single texts from Aristotle's *De Caelo* are continuous in relation to the other pieces contained in the manuscript, but intermittent, and not in sequence. Put into the order of the Greek Aristotle, we have the following fragments:

	fol.	<i>De Caelo</i> ed. Bekker	contiguous pieces
1.	110–119	I 9, 279 a 3–10, 280 a 34	I 9, 279 a 3 – I 12, 283 a 30
2.	99–108	I 11, 280 b 1–12, 282 a 4	
3.	89–98	I 12, 282 a 4 – 283 a 22	
4.	120	I 12, 283 a 22–30	
5.	121	I 12, 283 b 7–14	I 12, 283 b 7–21
6.	124	I 12, 283 b 14–21	
7.	73–78	II 1, 283 b 30 – 2, 285 a 1	II 1, 283b30–2, 285 a 1
8.	109	II 2, 85 a 16–31	II 2, 285a16–31
9.	122–123	II 3, 286 a 17 – b 7	II 3, 286 a 17 – b 7
10.	63–72	II 4, 287 a 23 – II 6, 288 b 26	II 4, 287 a 23 – II 9, 290 b 12
11.	79–88	II 6, 288 b 26 – II 9, 290 b 12	

Altogether, from the original volume five full quires (quinions) of 10 *folia* each have been preserved (110–119, 99–108, 89–98, 63–72, 79–88), seven *folia* from a sixth quire (120, 121, 124, 73–76), and five *folia* from yet another quire (77, 78, 109, 122, 123).⁴¹ In this estimate, based on the proportional length of the lost text, we assume a loss of one leaf between foll. 120 and 121, and between foll. 78 and 109, respectively, and of two leaves each between foll. 124/73, 109/122, and 123/63. Not counting these gaps, the codex comprises the last third of Book I and the first half of book II, thus covering a quarter of the whole work.

4.4. Structure of the Text and Annotation.

The text of the translation of Aristotle, divided into pericopes introduced by the words *Qāla Aristūṭālis* (*sic*, with short *i*), takes two thirds of each manuscript page, while the left third, in smaller script, contains a literal commentary. The latter is given in the form of short scholia (*ta'ālīq*), paraphrasing the progress of the argument or explaining single concepts, introduced by *yurīdu* “he means” or (referring to single words or expressions) *ifham* “to be understood as”, “that

⁴¹ In Vajda's inventory, the gap between 283 a 30 and 283 b 7 is not noted, but there is no gap, as indicated by him, between 283 b 11 and b 14.

is to say”. A three-point triangle at the end of a line of the text serves as a referent to the relevant marginal comment. At the end of each pericope of 2-3 pages, the Commentator, introduced by *Qāla l-mufasssīr*, gives a summary of the preceding section. Then the text resumes with the next lemma, *Qāla Aristūṭālis*.

Text and commentary are divided, as in all other commentary works of Abū l-Farağ ibn al-Ṭayyib (on the authorship, v. §§ 4.1-4.2, on Ibn al-Ṭayyib as a commentator, § 4.7, p. 255ff.), into lecture units, Arabic *ta'lim* (Greek $\pi\rho\alpha\lambda\lambda\alpha\iota\varsigma$). Book I of *De Caelo* contained 18 such chapters, *ta'ālīm* (references to the *Great Commentary*, *al-Taḥsīn al-kabīr* show that this was divided into identical units of *ta'ālīm*):

- Book I, *ta'lim* 13 = *De Caelo* I 9, 277 b 27 [?] (fragment starting at 279 a 3) to 279 b 3 (fol. 110a – 112b): There cannot be more than one world.
- Book I, *ta'lim* 14 = *De Caelo* I 10, 279 b 4 – 280 a 34 (fol. 112b–119b): Opinions on the duration of the world, if it is eternal, ungenerated or generated, imperishable or perishable.
- Book I, *ta'lim* 15 = *De Caelo* I 11, 280 b 1 – 281 b 18 (fol. 99a–106b): Analysis of the terms ‘ungenerated’ and ‘generated,’ ‘perishable’ and ‘imperishable,’ ‘possible’ and ‘impossible.’ A thing cannot have a capacity for opposites at the same time.
- Book I, *ta'lim* 16 = *De Caelo* I 12, 281 b 18 – 282 b 2 (fol. 106b–108b, 89a–91a): That which is for ever cannot be for a certain time only, thus it is not generated; the ungenerated and the imperishable are one, and co-extensive with the existent (*yatawassat al-mawğūd*, closing *taḥsīn*, f. 91a).
- Book I, *ta'lim* 17 = *De Caelo* I 12, 282 b 2 – 283 b 7 [? ms. fragment ending with 283 a 30, before a lacuna] (fol. 91a-98b, 120a-b): The ungenerated and the imperishable imply (‘follow’) each other, suppose potency of not-being and potency of being to coexist for an indefinite time to, is absurd.
- Book I, *ta'lim* 18 [possibly one more *ta'lim* for Book I, division lost in lacuna] = *De Caelo* I 12, 283b 6 [?]-22 [extant text 283 b 7–21 only] (fol. 121, 124): It is impossible that the ungenerated be perishable, or that the imperishable be generated, because if there was in it a potency to perish, this potency cannot be both realized and not realized with respect to a past state.

— The extant part of Book II starts with the second pericope of *ta'lim* 1:

- Book II, *ta'lim* 1 = *De Caelo* II 1 [283 b 26-30 missing due to loss of 2 folia], 283 b 30 – 284 b 5: The heaven is ungenerated and unperishable; it is the realm of divinity (*mawḍi' li-Llāh*). – *De Caelo* II 2: 284 b 6 – 285 a 1 (fol. 73–78) [285 a 2–a16 lost in lacuna of 2 folia], 285 a 16-a 31 (fol. 109) [285 a 31 – 286 a 2 lost in lacuna of 2 folia]: There is a right side and a left side in the heaven, also an above and a below, a front and a back.
- Book II, *ta'lim* 2 = *De Caelo* II 3 [286 a 3-, lost in lacuna], 286 a 17 – b 7 (fol. 122-123) [286 b 7 - b 9 lost]: Motion and rest in the universe: The heavenly eternal movement must be circular; there must be a centre at rest, this is earth, and its contrary, fire, and corresponding movements, and there are several revolutions of the celestial bodies. – II 4 [286 b 10 - 287 a 22 lost in lacuna of 2 folia], 287 a 23 – 287 b 21 (fol. 63-65): The shape of the heavenly body is spherical.
- Book II, *ta'lim* 3 = *De Caelo* II 5, 287 b 22 – II 6, 289 a 10 (f. 65b ult.-80.11): The rotation of the sphere of the fixed stars is from right to left. It is perfectly regular.

- Book II, *ta'lim* 4 = *De Caelo* II 7, 289 a 11–35 (fol. 80 b 11 – 82 b 6): The nature of the stars is that of the heavenly body in which they exist; albeit emitting heat and light, they do not consist of fire. — II 8, 289 b 1 – 290 a 29 (fol. 82 b 7–87 b apu.): The motion of the stars: The sphere moves, while the stars are at rest, having no movement of their own.
- Book II, *ta'lim* 5 = *De Caelo* II 8, 290 a 29 – b 11 (fol. 87 b apu.–88 b 11); II 9, 290 b 12 [breaking off after φανερόν δ' ἐκ τούτων = *wa-zāhirun mim mā qulnā*] (f. 88 b ult.): the stars having no organ for movement, they have no self-movement.

For a detailed survey of some of Ibn al-Ṭayyib's scholia and his short commentaria, intercalated between the pericopes of the text, v. *infra*, § 4.7.2.1, pp. 255ff. At several instances, the author refers to his *Great Commentary* (v. *infra*, § 4.7.3, pp. 265ff).

4.5. Ibn al-Ṭayyib's Arabic Translation of De Caelo

Both the testimonies of Ibn al-Sarī and Ibn Rušd affirm that Ibn al-Ṭayyib made a translation of his own on the basis of a Syriac *Vorlage* (Σ). The evidence of the text further shows that he made a translation of his own instead of using an extant translation as the basis of his annotations and commentary. While for Porphyry's *Isagoge* and Aristotle's *Categories* he had Ishāq ibn Ḥunayn's translation at his disposal, he must have been aware of the deficiencies of Ibn al-Biṭrīq's, used by everybody else in lack of an alternative version. We do not know if the partial revision B^C was at his disposal; in any case, it was not complete, and we cannot exclude the possibility that it was made at a later date (v. *supra*, § 3.1.2.2, p. 225).

While it can be shown from the indications mentioned above that Ibn al-Ṭayyib (a) made a translation of his own, and (b) translated from the Syriac, his translation is so close to Ibn al-Biṭrīq's that we cannot forego the conclusion that he used the same Syriac text. At the same time, he may have drawn on additional material, such as another Syriac version,⁴² or – for his translation as well as for his commentary – one of the Greek commentators available to him in Syriac.

4.5.1. Translation and Interpretation

¶ Common *interpretamenta* and *additamenta* Ar^B and Ar^T:

- I 12, 283 a 23: The proof of the mutual implication of 'ungenerated' and 'unperishable', demonstrated by way of a series of contrary / contradictory statements using letter symbols (cf. 283 a 1-3), is reversed and applied to proving the co-extension of 'generated' *vs.* 'perishable' / 'ungenerated' *vs.* 'imperishable'. This may have been a gloss added in Σ or its Greek exemplar, adding yet another variant to the repetitious drill of 282 b 15 – 283 a 3.
- II 5, 288 a 12: Added conclusion, containing an alternative interpretation, of 288 a 10-12: (βέλτιστον γὰρ κινεῖσθαι ἀπὸ τῆς τε κίνησιν καὶ ἄπαστον), καὶ ταύτην ἐπὶ τὸ τιμιώτερον.
 - ▶ Ar^B = Ar^T "and (we say) that its (*sc.* the sky's) movement proceeds from the most excellent place, and the most excellent place is the direction to its right. So it has now become clear and evident why the sky moves from the East to the West, and not from the West to the East".

Whereas the Greek commentators explain τιμιώτερον as being the forward movement, in the Arabic it is explicated as being the movement from right to left, i.e. from East to West.

⁴² An instructive example for such repeated translations and revisions on the basis of additional Syriac sources is found in the Arabic versions of Aristotle's *Sophistici Elenchi*; v. H. Hugonnard-Roche, "Contributions syriaques aux études arabes de logique à l'époque abbasside", *ARAM* 3.1/2 (1991), pp. 193-210.

4.5.2. *A Specimen Passage, I 9, 279 a 16 – b3: Comparative Analysis*

For a comparison of the two Arabic translations of Ibn al-Bitṛīq and Abū l-Faraḡ ibn al-Ṭayyib, here is a specimen passage in parallel layout, followed by a literal commentary. This is to demonstrate the dependence of both on a common Syriac *Vorlage*, as well as their differences regarding the textual basis, the techniques of translation, terminology, and style.

- *De Caelo* I 9, 279 a 16 – b 3 on the transcendent Beyond (τᾶκεῖ), persisting for eternity (αἰών), immortal and divine (ἀθάνατος καὶ θεῖος):

[279 a 16] Ἐξω δὲ τοῦ οὐρανοῦ δέδεικται ὅτι οὔτ' ἔστιν οὔτ' ἐνδέχε-
 [17] ται γενέσθαι σῶμα. Φανερόν ἄρα ὅτι οὔτε τόπος οὔτε κενὸν οὔ-
 [18] τε χρόνος ἔστιν ἔξω. Διόπερ οὔτ' ἐν τόπῳ τᾶκεῖ πέφυκεν, οὔτε
 [19] χρόνος αὐτὰ ποιεῖ γηράσκειν, οὐδ' ἔστιν οὐδενὸς οὐδεμία μετα-
 [20] βολὴ τῶν ὑπὲρ τὴν ἐξωτάτω τεταγμένων φορᾶν, ἀλλ' ἀναλ-
 [21] λοιώτα καὶ ἀπαθῆ τὴν ἀρίστην ἔχοντα ζωὴν καὶ τὴν αὐταρ-
 [22] κεστάτην διατελεῖ τὸν ἅπαντα αἰῶνα. (Καὶ γὰρ τοῦτο τοῦνομα
 [23] θεῖως ἔφθεγκται παρὰ τῶν ἀρχαίων. Τὸ γὰρ τέλος τὸ περι-
 [24] ἔχον τὸν τῆς ἐκάστου ζωῆς χρόνον, οὗ μὴθὲν ἔξω κατὰ φύσιν,
 [25] αἰὼν ἐκάστου κέκληται. Κατὰ τὸν αὐτὸν δὲ λόγον καὶ τὸ τοῦ
 [26] παντὸς οὐρανοῦ τέλος καὶ τὸ τὸν πάντα χρόνον καὶ τὴν ἀπει-
 [27] ρίαν περιέχον τέλος αἰῶν ἔστιν, ἀπὸ τοῦ αἰεὶ εἶναι τὴν ἐπωνυ-
 [28] μίαν εἰληφώς, ἀθάνατος καὶ θεῖος). Ὅθεν καὶ τοῖς ἄλλοις
 [29] ἐξήρτηται, τοῖς μὲν ἀκριβέστερον τοῖς δ' ἀμαυρῶς, τὸ εἶναι
 [30] τε καὶ ζῆν.

Καὶ γὰρ, καθάπερ ἐν τοῖς ἐγκυκλίους φιλοσοφῆ-
 [31] μασι περὶ τὰ θεῖα, πολλάκις προφαίνεται τοῖς λόγοις ὅτι
 [32] τὸ θεῖον ἀμετάβλητον ἀναγκαῖον εἶναι πᾶν τὸ πρῶτον καὶ
 [33] ἀκρότατον· ὁ οὕτως ἔχον μαρτυρεῖ τοῖς εἰρημένους. Οὔτε γὰρ ἄλ-
 [34] λο κρεῖττον ἔστιν ὅ τι κινήσει (ἐκεῖνο γὰρ ἂν εἶη θεϊότερον) οὔτ'
 [35] ἔχει φαῦλον οὐδέν, οὔτ' ἐνδεὲς τῶν αὐτοῦ καλῶν οὐδενός ἔστιν.
 [279 b 1] Καὶ ἄπαυστον δὴ κίνησιν κινεῖται εὐλόγως· πάντα γὰρ
 [2] παύεται κινούμενα ὅταν ἔλθῃ εἰς τὸν οἰκεῖον τόπον, τοῦ δὲ κύ-
 [3] κλη σώματος ὁ αὐτὸς τόπος ὅθεν ἤρξατο καὶ εἰς ὃν τελευτᾷ.

“In its discussions concerning the divine, popular philosophy (ἐν τοῖς ἐγκυκλίους φιλοσοφίμασι) often propounds the view that whatever is divine, whatever is primary and supreme, is necessarily unchangeable (τὸ θεῖον ἀμετάβλητον ἀναγκαῖον εἶναι πᾶν τὸ πρῶτον καὶ ἀκρότατον). This fact confirms what we have said. For there is nothing else stronger than it to move it – since that would mean more divine – and it has no defect and lacks none of its proper excellence” (*De Caelo* 279 a 30-35 trans. J.L. Stocks).

Ibn al-Bīṭrīq		Ibn al-Ṭayyib
وقد بيّنّا أنّنا وقلنا إنّهُ ليس خارجاً من السماء جرمٌ ولا يمكن أن يكون فيه جرم من الأجرام البتّة .	279 a 16	وقد بيّنّا فيها تقدّم أنّهُ ليس خارجاً من السماء جسمٌ ولا يمكن أن يكون فيه جسمٌ من الأجسام البتّة .
فقد استبان إذاً وصحّ أنه ليس خارجاً من السماء موضع ولا فراغ ولا زمان ، فإن كان هذا على هذا فلذلك صار ما هناك ليس في موضع ولا يستطيع الزمان أن يهرمه ، وليس شيء بخارج من آخر السلوك يستحيل ولا يتغيّر البتّة، لكنّه ثابت لا يتغيّر ولا يقبل الآثار . فالحيّة هناك ثابتة أفضل الحياة دائمة إلى الأبد .	279 a 17 279 a 18 279 a 20	وإذا كان هذا على هذا، فيبيّن ظاهرٌ أنه ليس خارجاً من السماء مكانٌ ولا خلاء ولا زمان ، ولهذا يكون ما هناك ليس هو في مكان ، ولا يمكن الزمان أن يهرمه ، ولا يمكن في الجسم المحيط أن يستحيل ولا يتغيّر البتّة، لكنّه ثابت لا يتغيّر ولا يقبل الانفعال ، بل حياته ثابتة دائمة على الدهر جارية على أفضل الوجوه .
فقد أصاب الأولون في تلخيص اسم الأبد وقالوا فيه قولاً شافياً ، وذلك أنهم قالوا إن الغاية والأفق المحيط بزمان حياة كل واحد من الأشياء الحيّة، الذي ليس من ورائه ولا من خلفه زمان آخر طبيعي، هو دهر ذلك الشيء وخلوده فعلى هذه الصفة نقول إن غاية أفق السماء كلّها والغاية المحيطة بالزمان كلّها الدائم هو دهر السما .	279 a 21	ولهذا ما يكون الأولون قد أصابوا في تلخيص اسم الدهر وقالوا فيه قولاً استقصوه ، وذلك أنهم قالوا إنّ الزمان المحيط بحياة كل واحد من الموجودات التي لها حياة، وليس بعده زمان آخر طبيعي، فهو الدهر الأبدي ولهذا نقول إنّ الفلك هو المحيط بالزمان كلّ الذي هو الدهر
وإنما اشتقّ هذا الاسم من تلقاء فعله لأنه دائم أبداً ، وهو في بعض الأشياء بين بياناً واضحاً وفي بعض الأشياء بين بياناً يسيراً .	279 a 27	وإنما اشتقّ له هذا الاسم من قبيل فعله إذ كان دائماً أبداً لأبداً إلى هي غير مائت . وهو إلى بعض الأشياء أقرب وإلى بعضها أبعد .

Ibn al-Bīṭrīq		Ibn al-Ṭayyib
<p>وقد ذكرنا في كتبنا في الفلسفة ، الخارجة أعني التي وضعنا للعامّة ، فقلنا إنه قد ينبغي للشيء الروحاني ألا يتغيّر ولا يفسد اضطراراً ، لأنه علّة كل علّة من عللها ، وليس من ورائها علّة أخرى . وهو على هذه الصفة التي وصفت لا يتغيّر ولا يستحيل ، تامّ كامل دائم إلى الأبد ،</p> <p>وذلك أنه ليس فوقه علّة أخرى معلولة حتى تحركه . فإن الفيت علّة أخرى كانت هي أيضاً ثابتة قائمة دائماً ليس من خلفها أفضل منها . ونقول أيضاً إنه لا يقبل شيئاً من الآفات ، أعني ذلك الشيء الروحاني ، وحركته دائماً لا انقطاع لها</p>	279 a 30	<p>وقد ذكرنا في كتبنا في الفلسفة ، الخارجة أعني التي وضعنا للعامّة ، وقلنا إنه ينبغي للشيء الروحاني ألا يتغيّر ولا يفسد من الاضطرار ، لأنه علّة جميع ما بعده من عالمه ، وليس من بعده علّة أخرى . وهو على الصفة التي ذكرت لا يتغيّر ولا يستحيل ، تامّ كامل دائم على الأبد ، إلهي لا يقربه الشرّ ، وغير محتاج إلي شيء من الخيرات التي هو سببها ، وليس فوقه علّة أخرى هو معلولها حتّى تحركه . فإن وجدت علّة أخرى فهي أيضاً ثابتة قائمة دائماً وليس من خلفها أفضل منها . وأيضاً فإنه لا يقبل شيئاً من الانفعالات أعني ذلك الجسم الروحاني ، وحركته دائماً لا انقطاع لها</p>
<p>ووقد يستحقّ أن تكون له هذه الحركة لأنّ الأشياء كلها تسكن حركاتها وذا انتهت إلى مواضعها ؛ وأما هذا الجرم الفائق الشريف فلا تسكن حركته البتّة ، لأن موضع هذا الجرم المستدير ، واحد أعني أن موضع ابتداء حركته هو موضع آخر حركته . فلذلك صار دائماً الحركة لا يسكن البتّة .</p>	279 b 1	<p>فبالوجوب ما كانت له هذه الحركة ، لأنّ الأشياء كلّها تسكن حركتها اذا انتهت الى مواضعها فأما هذا الجسم الفائق الشريف فلا تسكن حركته البتّة ، لأنّ المبدأ الذي منه يأخذ في الحركة عنده يقطع . ولذلك صارت حركته دائماً لا سكون لها .</p>

Commentary

- 279 a 16 δέδεικται ὅτι ...
- ▶ Ar^B *wa-qad bayyannā ānifan wa-qulnā innahū ...*
- ▶ Ar^T *wa-qad bayyannā fī-mā taqaddama annahū ...*

In both versions, most probably on the basis of the Syriac, the Greek particles underlining the coherence and evidence of the argument are elaborated in the style of the late Greek commentary-lecture (v. *infra*, § 4.6.2, for further examples). Against version B, heavily loaded with hendiadys, amplification and paraphrasis, version T generally has less elaborate phrasing.

- 279 a 18 φανερόν ἄρα ...
- ▶ *fa-qadi stabāna idan wa-ṣahḥa annahū ... fa-in kāna hādā' alā hādā', fa-li-dālika ṣāra ...*
- ▶ *wa-idā kāna hādā' alā hādā', fa-bayyinun zāhirun annahū ... wa-li-hādā yakūnu ...*

Ar^B's phrase is one of most frequently used in this version for rendering Greek particles as δῆ, ἄρα, underlining evidence. While Ar^T has similar phrasing, it divides the argument between a recap and a conclusion.

- 279 a 20 τῶν ὑπὲρ τὴν ἐξωτάτω τεταγμένων φορᾶν
- ▶ Ar^B *ṣay'un min ḥāri ḡi āḥari l-sulūki*
- ▶ Ar^T *al-ḡismāni l-muḥītu*

Ar^B's terminology is not yet consolidated, and inconsistent in the rendering of terms not recognized as such. While Ar^T does not translate the Greek expression, but replaces it by a technical term in the sense of τὸ περιέχον σῶμα, referring to the outermost sphere, Ar^B gives a somewhat awkward rendering *verbum de verbo* (passing over τεταγμένη as an auxiliary), missing the superlative ἐξωτάτω (not available in Syriac).

Cf. Themistius, *In De Caelo* <lat.>, p. 55.24-25 Landauer: Haec autem omnia illi corpori necessarie contingunt, quod in circulum fertur [necessarie: necessario Landauer, item *editio princeps* Venetiis 1574, f. 15v47-48, to be emended from the Hebrew: *yehayyeb*] (E. Coda)]; *ibid.* pp. 55.39-56.2 ait deinde [sc. Alexander] Si enim primam causam intellexerit, verbis τὴν ἐξωτάτω φορᾶν motum sphaerae superioris intendet [re-translation by Landauer of Simplicius, *In De Caelo*, pp. 287.30-288.1 Heiberg: ὑπὲρ δὲ τὴν ἐξωτάτω φορᾶν εἰ μὲν λέγοι, φησί (ὁ Ἀλέξανδρος), περὶ τοῦ πρώτου αἰτίου; ed. Venet., f. 16r4-5: Ait deinde: si enim primum mobile intellexerit, omnino extremum corpus superius intelliget, quod in circulum fertur; <hebr.>, ed./trans. Coda: "Then he (Alex.) says that (Aristotle) intends the First Cause, hence he understands this when he speaks of an ultimate motion moved by its driving cause in a circle".

- 279 a 21 (τὴν ἀρίστην ἔχοντα ζῶην) καὶ τὴν αὐταρκεστάτην
- ▶ Ar^B *tābit lā yataḡayyar*
- ▶ Ar^T *lā yataḡayyar wa-lā yaqbal al-infi'āl*

αὐτάρκης, a specifically Greek notion, found the translators (the Arabic being based on the Syriac) at a loss, content with taking up *tābit* from the previous clause (*tābit lā yataḡayyar / lā yataḡayyar wa-lā yaqbal al-infi'āl* "unalterable and impassive").

- 279 a 22-27 αἰών
- ▶ Ar^B a22 *al-abad*; a25, a27 *al-dahr*; a22 τοῦτο τοῦνομα *ism al-abad*
- ▶ Ar^T *dahr*, a25 *al-dahr al-abadī*; a22 τοῦτο τοῦνομα *ism al-dahr*

In both versions αἰών is recognized as a term, as shown in the explication of 279 a 22 τοῦτο τοῦνομα: Ar^B *ism al-abad*, Ar^T *ism al-dahr*. Only Ibn al-Ṭayyib is consistent in rendering αἰών as

dabr, and only Ar^T lets transpire, in a25 αἰὼν ἐκάστου : *al-dabr al-abadi* the speculative connotation and the notion of transcendence. Ibn al-Biṭrīq at first (a22-23) introduces *abad* in place of *dabr*, but in a25/27 has *dabr*; 279 a 27 *li-annahū dā'im abad* might be a plausible, if somewhat tautological explication of *abad* αἰὼν unless Ar^B had replaced the term *abad*, introduced in the first instance, by *dabr wa-hulūd*. So the announcement of an “exposition of the name of *abad*” (*talhīs ism al-abad*) opens out, by inconsistent usage, onto a different concept: *dabr*, the old Arabic concept of Time as blind fate, and then (a25) – completing the confusion – this is evolved into a hendiadys: *dabr wa-hulūd*. In a close rendering of Σ, Ar^B at first defines αἰὼν as an individual property: *huwa dabr dālika l-šay' wa-hulūdihū* (αἰὼν ἐκάστου a25), and then, in a loose rendition using a false analogy, a27: *dabr al-samā'*. The philosophical significance is not conveyed, but the concepts are blurred.

Against Ar^B, Ar^T is strictly literal, giving the correspondences θεῖος : *ilāhī* and ἀθάνατος : *gayr mā'it*, but fails equally in the crucial point. Neither of the two versions succeeds in conveying the connection between word and concept, and to render the Aristotelian ‘etymology’ of αἰὼν. Strictly speaking, this would be possible only by referring to the linguistic elements of the Greek (similarly, the translation of I 3, 270 b 22-24 αἰθήρ was bound to fall short of the Greek explanation αἰθέρα προσωνόμασαν τὸν ἀνωτάτω τόπον, ἀπὸ τοῦ θεῖν ἀεὶ τὸν ἄδιδιον χρόνον θέμενοι τὴν ἐπωνυμίαν αὐτῷ. Not the coinage of an adequate word for the concept is being praised, but the interpretation and application of the concept. Aristotle’s ‘etymology’ (*istiqaq*) loses its analytical character (αἰὼν < ἀεὶ εἶναι), becoming a circumstantial explanation making no real sense: *id kāna dā'imān abadan* “since it is perpetual and eternal”.

- 279 a 28 ἀθάνατος καὶ θεῖος : om. Ar^B (B*?)
- 279 a 28-30 Ὁθεν καὶ τοῖς ἄλλοις ἐξήρτηται, τοῖς μὲν ἀκριβέστερον τοῖς δ' ἀμαυρῶς, τὸ εἶναί τε καὶ ζῆν.

The sentence baffled the translators; τὸ εἶναί τε καὶ ζῆν is missing altogether in Ar^B. While Ar^T seems to have made a better sense of what transpired from the Greek wording: “This (the αἰὼν) is closer to some things, and farther from some things”, Ar^B changes the ontological connection between the αἰὼν and the existent beings (cf. *Simpl., In De Caelo*, p. 288.17-20 Heiberg) into a logical or cognitive one, *bayān wādīh* – *bayān yasīr*. Both versions will have relied on glosses, translated instead of the obscure phrase they were meant to explain.

Cf. Them., *In De Caelo* <lat.>, p. 56.31 Landauer: *atque ab illius esse ceterarum etiam rerum esse pendet, harum quidem evidentius, harum vero obscurius, secundum quod illi propinquiore vel remotiores existunt [ab-pendet: emend. Landauer];* Alatino’s translation as in the *editio princeps*, f.16r28-30: *Ex quo etiam ceteris rebus, quae in generatione consistunt, communicata sunt (in aliis evidentius, in aliis obscurius) status et vita; secundum quod illi propinquiore vel remotiores existunt; Zerahya’s Hebrew version, transl. from E. Coda’s critical ed. [cf. p. 37.26-27 Landauer]: “And dependent from this are the other things, in respect to some less, in respect to others more (visibly) [cf. Ar^B], according to whether they are closer to or farther from us [cf. Ar^T].”*

- 279 a 30-31 καὶ γὰρ, καθάπερ ἐν τοῖς ἐγκυκλίοις φιλοσοφήμασι περὶ τὰ θεῖα, πολλάκις προφαίνεται τοῖς λόγοις.
- 279 a 31 περὶ τὰ θεῖα: om. Ar^Σ {Ar^B Ar^T}
- ▶ Ar^Σ *wa-qad dakarnā fī kutubinā fī l-falsafa al-hāriḡa a'nī llatī waḡa'nā li-l-amma* (“We have explained in our books on the exoteric philosophy, i.e. those we wrote for the general public”).

The following passage, according to modern scholarship, is a reference to popular philosophy, but was understood by the Greek commentators and also by the Arabic translator to refer to Aristotle's exoteric writings. Even today, this latter interpretation has followers.⁴³

Cf. Simpl., *In De Cael.*, pp. 288.31-289.1 Heiberg: ἐγκύκλια δὲ καλεῖ φιλοσοφήματα τὰ κατὰ τάξιν ἐξ ἀρχῆς τοῖς πολλοῖς προτιθέμενα, ἅπερ καὶ ἐξωτερικὰ καλεῖν εἰώθαμεν.

- 279 a 31-33 πολλάκις προφαίνεται τοῖς λόγοις ὅτι τὸ θεῖον ἀμετάβλητον ἀναγκαῖον εἶναι πᾶν τὸ πρῶτον καὶ ἀκρότατον.

While the concept of αἰών, notwithstanding a fairly intelligible rendering of 279 a 18-30, remained foreign to the translators, the introduction of τὸ θεῖον ('the divine'), in Arabic *al-rūhānī* ('the spiritual entity'), prompts an enlarged paraphrase of the final section of Chapter 9, on the attributes of the transcendent Beyond:

Σ {Ar ^{BT} } We have explained in our books on the exoteric (Ar. 'external') philosophy, i. e. those which we [!] wrote for the general public (<i>al-amma</i>), and have said,	30 καὶ γὰρ, καθάπερ ἐν τοῖς ἐγκυκλίοις φιλοσοφήμασι περὶ τὰ θεῖα, πολλάκις προφαίνεται τοῖς λόγοις
Σ {Ar ^{BT} } that by necessity this spiritual thing (<i>hādā l-ṣay' al-rūhānī</i>) must be unchanging and indestructible,	32 ὅτι τὸ θεῖον ἀμετάβλητον ἀναγκαῖον εἶναι [πᾶν]
Ar ^B because it is the cause of every cause of †their† causes (<i>ilalibā</i>), Ar ^T because it is the cause of all that comes after it in its world (<i>min 'ālamihī</i>),	32-33 (τὸ πρῶτον καὶ ἀκρότατον)
Σ {Ar ^{BT} } there being no other cause beyond it.	
Σ {Ar ^{BT} } It is of this description that has been stated, unchanging and unalterable, perfect, complete and perpetual in eternity,	33 (ὁ οὕτως ἔχων μαρτυρεῖ τοῖς εἰρημένοις)
Ar ^T and divine, no evil (<i>ṣarr</i>) shall approach it, and it is not in need of a perfection that should be its cause;	35 οὐδ' ἔχει φαῦλον οὐδέν, οὐτ' ἐνδεὲς τῶν αὐτοῦ καλῶν οὐδενός ἐστιν.
Ar ^B because above it there is no other causa causata ⁴³ which should move it; Ar ^T and above it there is no other cause the causatum of which it (sc. this transcendent being) should be;	33-34 οὔτε γὰρ ἄλλο κρεῖττόν ἐστιν ὃ τι κινήσει
Σ {Ar ^{BT} } and if there were another cause, this in its turn would be steadfast, enduring and eternal, and nothing more excellent would be beyond it.	(ἐκεῖνο γὰρ ἂν εἴη θειότερον)
Σ {Ar ^{BT} } And further, this – i.e., this spiritual thing (this spiritual body Ar ^T) – will not be affected Ar ^B by any of the evils (<i>āfāt</i> 'damages', φαῦλον), Ar ^T (<i>infi'ālāt</i> 'affections', πάθη)	35 οὐτ' ἔχει φαῦλον (v.l. πάθος Ar ^T) οὐδέν.
Σ {Ar ^{BT} } and its movement is eternal and unceasing, Ar ^B and by rights this movement belongs to it ... Ar ^T and necessarily this movement belongs to it, ...	279 b 1 Καὶ ἄπαυστον δὴ κίνησιν κινεῖται εὐλόγως ...

⁴³ Cf. A. Jori, *Aristoteles: Über den Himmel, übersetzt und erläutert*, Akademie-Verlag, Berlin 2009 (Aristoteles. Werke in deutscher Übersetzung, 12.3), p. 410.

⁴⁴ *'illatun ubrā ma'lūlatun* : leg. *'illatun ubrā <huwa> ma'lūlūhā*, cf. Ar^T?

- 32 τὸ θεῖον *al-šay' al-rūḥānī* “this spiritual thing”

rūḥānī ‘spiritual’ is used only here in Ibn al-Ṭayyib’s translation, but more frequently in Ibn al-Biṭrīq’s version, as a term translating the Greek θεῖος. This usage reflects a Neoplatonic influence (*rūḥ*: πνεῦμα) and is found most prominently in the Arabic Plotinus source, *Kitāb Aristūṭālīs al-musammā Utūlūḡiyā ay al-rubūbiyya (Theologia Aristotelis)*. This was translated by Ibn al-Biṭrīq’s contemporary Ibn Nā’ima al-Ḥimṣī, working like him in the circle of al-Kindī, and is closely related in terminology and style to his translations. Cf. G. Endress, “Platonizing Aristotle: the Concept of ‘spiritual’ (*rūḥānī*) as a Keyword of the Neoplatonic Strand in Early Arabic Aristotelianism” (quoted above, p. 222, n. 23), pp. 265-79.

- τὸ πρῶτον καὶ ἀκρότατον
 - ▶ Ar^B because it is the cause of every cause of †their† causes (*‘ilalihā*),
 - ▶ Ar^T because it is the cause of all that comes after it in its world (*min ‘ālamihī*)

The text in Ar^B is corrupted. While the translation “the cause of all causes” may be a simple emendation *ad sensum* at first look, it is not justified by the syntax of the Arabic phrase. But then, if Ar^T is a correct rendering of the common Syriac *Vorlage*, Ar^B could be easily explained as a misreading of the latter: *عللها > علله*.

In both Arabic translations, based on the Syriac, the transcendent Beyond becomes the First Cause. While the passage does not contain explicit evidence of an Unmoved Mover, some early commentators understood it so, and the question has continued to be discussed in modern scholarship. It is true that Aristotle ascribes life to the ‘things out there’, as elsewhere to the pure actuality of the First Mover. But the cosmology of the *De Caelo* in general does not presuppose the theory of the Prime Mover, and would contradict it in some respects. It seems more probable that the plural τὰκεῖ denotes separately existing, *supra*-mundane principles which like Plato’s realm of subsistent ideas are outside the heavens, while the heavens constitute space, movement and time, and – again as in Plato’s cosmology – are ensouled.⁴⁵

- 279 a 35 – b 1 (οὐτ’ ἔχει φαῦλον οὐδὲν) οὐτ’ ἐνδεὲς τῶν αὐτοῦ καλῶν οὐδενός ἐστιν

Missing in both versions at the appropriate place. Version Ar^T inserts, however, further above, a rendering of οὐτ’ ἔχει φαῦλον ... ἐστιν – probably taken from a gloss found in the Syriac exemplar. In this way, the first member of the disjunction, οὐτ’ ἔχει φαῦλον οὐδὲν, is translated twice. In the second (proper) place, the translation is based on a variant reading: φαῦλον : πάθος.

4.6. *The Language of the Translations: Terminology and Style in Comparison*

Both the oldest Arabic translation of *De Caelo*, made by Ibn al-Biṭrīq in the age of al-Ma’mūn, and Ibn al-Ṭayyib’s new translation go back to the same Syriac version. The comparative analysis of a specimen passage, given above (pp. 240-6), provides ample evidence. Ibn al-Ṭayyib had no Greek, so he was unable to emend the text independently; Syriac elements – most striking is his use of a Syriac loanword (ܩܟܟܪܐ *kakkerā*) for τάλαντον – show that he used the Syriac directly without an intermediary. In view of many differences against Ibn al-Biṭrīq’s and other known translations, we may exclude that Ibn al-Ṭayyib revised an earlier version, although this was a frequent practice

⁴⁵ P. Moraux [ed.], Aristote, *Du ciel*, Les Belles Lettres, Paris (CUF), p. XLIV, with references (note 5); but according to Alexander (as quoted by Simpl., *In De Caelo*, p. 287.19-21 Heiberg), the whole passage would refer to the sphere of the fixed stars exclusively.

(cf. the many cases noted by Ḥunayn ibn Ishāq and Ibn al-Nadīm). While the partial revision **B^c** did not go beyond *De Caelo* I 6 (except for routine changes of obsolete terminology), Ibn al-Sarī's quotation of *De Caelo* III 8 from the Syro-Arabic version of 'Īsā ibn Zur'a (v. *supra*, pp. 226-7) shows that Ibn al-Ṭayyib used neither this – evidently different from his own – nor any other Arabic predecessor, or at the most occasionally as an auxiliary reference. For differences in interpretation, possibly dependent on one of the commentators known in Syriac or Arabic translation, v. *supra*, pp. 240ff.

References are generally taken only from those parts of the Arabic translations of *De Caelo* which exist in both versions, Ibn al-Biṭrīq's (Ar^B) and Ibn al-Ṭayyib's (Ar^T). Full comparative glossaries and surveys of the usage of the early translation and the later versions of *De Caelo*, both illustrated by parallels and contrastive pairs from the circle of al-Kindī and the later, post-Ḥunayan translations, are found in the relevant sections of my previous studies, *ArÜbCael* (above, n. 2) and *ProclArab* (above, n. 19).

4.6.1. Terminology: Borrowing, Adaptation, and Transposition

In terminology, we observe several methods used for the transposition and for the creation of terms. In translation as well as in the subsequent process of integration, the language of Arabic philosophy was built between the translators of the Kindī circle and their readers, and accomplished by the founders of Islamic philosophy in its proper sense from al-Kindī to al-Fārābī and Ibn Sīnā.

4.6.1.1. Functional

The primitive, but (even in the first period of Arabic translations) by no means predominant procedure of functional transposition – a foreign or an indigenous lexeme or syntagm is allotted to represent the function of the technical term, by convention – is that of the adoption of loanwords. These are words adopted or borrowed, with little modification, from the source language. Loan-translations, on the other side, are expressions adopted from the source through translating its semantic elements more or less literally ('calque'). Both serve as functional shells for the concepts defined by the respective disciplines and systems.

a) Loanwords: Transliterated Greek and Syriac Words and Other Loanwords

Terms adopted from Greek Loanwords current in Syriac

Several Greek loanwords were adopted by the translators from Syriac, but not necessarily from the immediate Syriac sources used. We should note that the use of such words, naturalized in Arabic even before being used in translation, does not necessarily point to a Syriac *Vorlage*. Only a minority however were naturalized to become part of the Arabic vocabulary in the long run (such as *hayūlā* and *uṣṭuquṣ*). Generally, many of the transliterated Greek and Syro-Greek loanwords were replaced at a later stage with regular Arabic terms, introduced by the second generation of Arab translators and adopted by the Arab readers of their work (e.g., the translations of Aristotle's *Organon* and *Physics* made by Ishāq ibn Ḥunayn and his circle in the late 9th/early 10th century, and by Abū Biṣr Mattā and Yahyā ibn 'Adī in the 10th century).

Some Greek loan-words had been current in Syriac, whence they were adopted in Arabic:

- γένος : *ǧīns* < Syr. *gensā* [not occurring in our *De Caelo* texts].
- στοιχεῖον 280 a 16 etc. : *uṣṭuquṣṣ*⁴⁶ (< Syr. *estūksā*) Ar^B / Ar^T
- τάζεις : *ṭaqs* < Syr. *ṭaksā*, used in conjunction with Arabic equivalents, v. *infra*, p. 250.

ὕλη 286 a 25 : *hayūlā* Ar^B / Ar^T. This is the traditional vocalization of the Arabic transliteration of Syriac ܠܘܠܐ, where *yw* represents Greek *y*. In both versions.

Both *hayūlā* and *uṣṭuquṣṣ* are concurring with Arabic *unṣur*:

- 279 a 8 ἐξ ἀπάσης ἄρ' ἐστὶ τῆς οὐκείας ὕλης ὁ πᾶς κόσμος· ὕλη γὰρ ἦν αὐτῷ τὸ φυσικὸν σῶμα καὶ αἰσθητόν
 - ▶ Ar^B *wa-dālika anna l-ālama kullahū murakkabun min 'unṣurihī kullihī l-mulā'imi lahū l-lā'iqi bihī, wa-qad qulnā ānifan inna 'unṣura l-ālamī huwa l-ǧirmu l-ṭabī'iyu l-maḥsūs.*
 - ▶ Ar^T *li-anna l-'unṣura bi-asrihī mawǧūdun fi l-'ālamī wa-huwa murakkabun minhu, wa-qad qulnā ānifan anna 'unṣura l-ālamī huwa l-ǧismu l-ṭabī'iyu l-maḥsūs.*

- 286 a 25 ἡ γὰρ αὐτὴ ὕλη τῶν ἐναντίων
 - ▶ Ar^B *li-anna hayūlā l-addādi wāḥidatun*
 - ▶ Ar^T *min qibali anna l-hayūlā li-l-aḍḍādi wāḥidatun bi-'aynihā.*

The use of *'unṣur* for ὕλη, beside the loanword *hayūlā*, is only found in the early period of the Graeco-Arabic translations, notably in the circle of al-Kindī (v. references for Uṣṭāṭ in *Die arabischen Übersetzungen von Aristoteles' Schrift De Caelo* [above, n. 2], p. 123). In later translations, *'unṣur* occurs as an equivalent of στοιχεῖον (instead of the loanword *uṣṭuquṣṣ*), when the term denotes one of the four elements.

Syriac:

- τάλαντον: *kakra*. Most striking as evidence for Ibn al-Ṭayyib's independent use of the Syriac *Vorlage* is a Syriac loanword, *kakra*, from the Syriac *kakkerā*, for Greek τάλαντον, *De Caelo* I 11, 281 a 9, a *hapax legomenon* not attested in any other Arabic text.

Persian

While some Persian loanwords, quite common in the early translations, survived into later usage, Ibn al-Biṭrīq's translation has one rare term deserving special attention:

κύβος 305 b 30 etc.: *narda* Ar^B. Also found in the Arabic version of Arist., *Metaph.* Δ 17, 1002 a 22 made by another member of the 'Kindī circle', Uṣṭāṭ (p. 278.5 Bouyges). Otherwise, the Persian term occurs in Arabic only for the dice used in the game of *nard* ('backgammon'). For the collective (*la'b*) *al-nard*, *narda* is the *nomen unitatis* ('single dice').

baḥt ('luck, fortune') is used in conjunction with Arabic terms, but mostly replaced in the later version: ὡς ἔτυχε 301 a 11 *bi-l-baḥt* Ar^B, 289 b 26 *bi-manzilāt al-baḥt wa-l-muṣādafa* Ar^B; 289 b 26 *bi-l-baḥt wa-l-ittifāq* Ar^T, 290 a 31 *abaṭan bi-l-ittifāq* Ar^T.

Some foreign words were already part of the Arabic vocabulary before being used by the translators as technical terms: *ǧawhar*, commonly used for the Greek οὐσία ('substance') – not occurring in our *De Caelo* texts.

⁴⁶ On the form, see H. Gätje, Review of E. Bannerth, *Das Buch der Vierzig Stufen von 'Abd al-Karīm al-Ġīlī*, in *Wiener Zeitschrift für die Kunde des Morgenlandes* 56 (1960), pp. 322-5, in part. p. 324, n. 2.

Greek Words Transliterated by the Translator, used singly and in combination with Arabic terms:

In not a few cases, the use of transliterated Greek terms shows uncertainty of the early translators regarding the precise meaning and the adequate rendering of technical terms of logic and physical/metaphysical principles:

- ἀπόφασις: Ar^B *abūfāsīs*, rendered by Ibn al-Ṭayyib as *salb* and *naqīd*, *tanāqud*, respectively.

	Ar ^B	Ar ^T
ἀπόφασις 281 b 33	<i>abūfāsīs</i>	<i>tanāqud</i> (<i>ḥadday al-tanāqud</i>)
ἀπόφασις 282 a 4. 6. 7	<i>abūfāsīs</i>	<i>naqīd</i>
ἀπόφασις 282 a 10	<i>abūfāsīs</i>	<i>salb</i>

- *De Cael.*, I 12, 282 a 4-10: Ἐπεὶ δ' ἀπόφασις τοῦ μὲν αἰεὶ δυναμένου εἶναι τὸ μὴ αἰεὶ δυνάμενον εἶναι, τὸ δ' αἰεὶ δυνατὸν μὴ εἶναι ἐναντίον, οὗ ἀπόφασις τὸ μὴ αἰεὶ δυνάμενον μὴ εἶναι, ἀνάγκη τὰς ἀποφάσεις ἀμφοῖν τῷ αὐτῷ ὑπάρχειν, καὶ εἶναι μέσον τοῦ αἰεὶ ὄντος καὶ τοῦ αἰεὶ μὴ ὄντος τὸ δυνάμενον εἶναι καὶ μὴ εἶναι· ἡ γὰρ ἐκατέρου ἀπόφασις ποτε ὑπάρξει, εἰ μὴ αἰεὶ.

Ar^B wa-naqūlu ayḍan inna abūfāsīs al-šay'i allaḍī laḥū quwwatun an yakūna dā'iman aysa huwa allaḍī laysat laḥū quwwatun an yakūna dā'iman aysa, fa-ammā ḍidduhū fa-huwa llaḍī laḥū quwwatun an yakūna dā'iman laysa; fa-ammā abūfāsīs ḥāḍā l-ḍiddi fa-huwa llaḍī laysat laḥū quwwatun an yakūna dā'iman laysa. fa-naqūlu innahū qad yakūnu bayna ḥāḍayni l-abūfāsīs šay'un yatawassaṭuhumā wa-huwa llaḍī laḥū quwwatun an yakūna aysa wa-an yakūna laysa fi zamānin wa-zamānin, wa-ḍalika anna abūfāsīs kulli wāḥidin minhumā yakūnu laysa fi zamānin mā li-anna kilayhimā laysā dā'imayni.

Ar^T fa-inna naqīḍa qawlinā inna al-šay'a laḥū quwwatun 'alā an yūḡada dā'iman huwa qawlunā inna laysa fi l-šay'i quwwatun 'alā an yūḡada dā'iman, wa-ḍidduhū huwa an yakūna fi l-šay'i quwwatun 'alā allā yūḡada dā'iman; wa-naqīḍu ḥāḍā huwa qawlunā laysa fi l-šay'i quwwatun 'alā an lā yūḡada dā'iman. wa-ḥidā'a ḥāḍā l-taqābuli yakūnu baynahumā mutawassīṭun, wa-huwa l-šay'u llaḍī fiḥi quwwatun 'alā an yūḡada wa-an lā yūḡada fi zamānin wa-zamānin, wa-salbu kulli wāḥidin minhumā yakūnu fi zamānin mā min qibali annahumā ḡayru dā'imayni.

In Arabic logical writings, both in the translations of the *Organon* (as in *Cat.* 13 b 2-3) and in original works, *ḍidd* and the verbal noun *taḍādd* are used for the contrary opposite (ἐναντίον) (v. *Cat.* ed. Georr, *Lex. s.v.*; A.M. Goichon, *Lexique de la langue philosophique d'Ibn Sīnā (Avicenne). Vocabulaires comparés d'Aristote et d'Ibn Sīnā*, Desclée de Brouwer, Paris 1938, no. 381; as also in the translations of *De Caelo*, wherever the strict sense of ἐναντίον is concerned). The contradictory opposite of statements (ἀπόφασις, *De Int.* 17 a 25-35) is normally rendered by Arabic *salb* 'negation' (v. *De Int.* ed. Pollak, *Glossary s.v.*; Goichon, *Lexique*, nos. 715-16). Ibn al-Bīṭrīq, not yet disposing of an established terminology, preferred to transliterate ἀπόφασις as *did*, most probably, his Syriac source. It is striking that Ibn al-Ṭayyib, who wrote full literal commentaries on *Cat.* and *De Int.*, did not use the clear-cut terminology established in all the current translations, using *salb* in one case, but elsewhere *naqīd* and *tanāqud*, both corresponding rather to Greek ἀντίφασις (*De Int.* 17 a 33, cf. *De Int.* ed. Pollak, *Glossary s.v.*).

In the Q family of manuscripts of Ar^B, *abūfāsīs* was replaced by *naqīd* in some instances. The inconsistent terminology was noticed by a reader of Ar^B, commenting in a marginal note on 282 a 14 (mss. Ḥaydarābād 441 and Iṣfahān 301) that "the translation of the *šayḥ* Abū l-Faraḡ, secretary of the Katholikos, has replaced this (*abūfāsīs*) in [the reading of] the exemplar (*muntasab*), by *naqīd* (opposite), and this is correct, since indeed he means the negation" (see full quotation above, p. 234, § 4.2.4 b).

Ibn al-Biṭrīq, in default of an adequate Arabic terminology, transliterated the Greek word as well in the case of *κατάφασις*:

- *κατάφασις* ‘affirmation’

	Ar ^B	Ar ^T
<i>κατάφασις</i> 286 a 26	<i>qaṭāfasīs</i>	<i>malaka</i>

ἢ γὰρ αὐτὴ ὕλη τῶν ἐναντίων, καὶ τῆς στερήσεως πρότερον ἢ *κατάφασις* *De Caelo* II 3, 286 a 26

Ar^B *li-anna hayūlā l-adḍādi wāhidatun, wa-inna l-qaṭāfasīs qabla l-‘adami*, p. 236.14 Badawī

Ar^T *min qibali anna l-hayūlā li-l-a‘ḍādi wāhidatun bi-‘aynihā, wa-inna l-malakata tataqaddamu l-‘adama*, *De Caelo* 122 b 5

▪ The use of *malaka* for *κατάφασις* in Ar^T (normally translated by *iḡāb* ‘affirmation’ vs. *salb* ‘negation, privation’) is justified by the context, where *κατάφασις* vs. *στέρησις* may be regarded as synonymous with *ἔξις*.

Some of these transliterated terms were coupled with an Arabic equivalent for the sake of clarity, while the Arabic word in itself was not deemed sufficiently specific as a technical term:

κλεψύδρα *De Caelo* II 13, 294 b 21 = *al-āniya allatī tud‘ā qlbsdry / qlsydry wa-hiya l-naššāfa* ‘the vessel called *qalafsudrī*, i.e. the siphon’ Ar^B. (The passage is not extant in Ibn al-Ṭayyib’s translation).

τάξις 280 a 17: *šarḥ*, 286 b 34, 293 a 14, 301 a 2. 5, elsewhere *šarḥ wa-martaba*, *šarḥ wa-ṭaqs* Ar^B; against *šay‘ manzūm* (‘an ordered thing’ Ar^T 280 a 17).

ἄτακτος 280 a 7: *ḡayr dī šarḥ*; 280 a 8 *laysa labū šarḥ* Ar^B, against 280 a 7: *ḡayr manzūm*, 280 a 8 *‘adam al-nizām* Ar^T.

▪ The loanword *ṭaqs* (Greek *τάξις*, ‘order’) appears in syntagmas with Arabic *šarḥ* (‘dissection, orderly disposition’), and occasionally *martaba* (‘order’) in the same meaning is a characteristic feature of Ibn al-Biṭrīq’s terminology as well as of other translators of his group. It was generally replaced by Arabic *nizām*, as also in Ibn al-Ṭayyib’s version.

But many of the *ad hoc* transliterations of the early translations fell from use as soon as Arabic equivalents gained acceptance, except for terms figuring as titles of some parts of the Aristotelian encyclopaedia, or those naturalized completely in analogy to the paradigms of Arabic morphology: *safsata* for the *Sophistica*, and *falsafa*, Greek *philosophía*, in distinction from the more general Arabic *ḥikma*, originally ‘wise saying’, ‘wisdom.’

b) Loan-translations

Like loan-words, loan-translations function as shells for the concepts they are appointed to represent: from the root *naṭaqa* ‘speak’, translating the basic meaning of Greek *λέγειν*, are formed *nāṭiq*, for Greek *λογικός* ‘rational’, and *manṭiq* ‘logic’.

mabsūt, a calque on the Syriac part. pass. *pešūt*, for *ἀπλοῦς*, is a characteristic term of the translations of Ibn al-Biṭrīq and the Kindī circle in general, replaced by the standard *basīt* in Ibn al-Ṭayyib’s version:

ἀπλοῦς 279 a 4, 288 a 11, 288 a 34, 288 b3, 288 b 19: *mabsūt* Ar^B, *basīt* Ar^T.

‘illa signifying ‘cause’ is a loan from Syriac *‘elletā*, against the ancient Arabic signification ‘defect, illness’. The word, through the reception of the early translations in philosophy and scientific writings, continued in use, but was mostly replaced by *sabab* in later translations and in general usage.

aysa, a neologism used in the opposition *laysa* vs. *aysa*: οὐκ (μὴ) εἶναι vs. εἶναι only, may be regarded as a calque on Syriac *layt* vs. *īt*. In Ibn al-Ṭayyib, as generally in all of the later translations, it is replaced by *yū ḡad* vs. *lā yū ḡad* (examples below, p. 252).

c) Positing Functional Equivalence

Apart from verbal or structural loans, new terminological conventions – especially in the early period of reception – were modelled not on the accurate transfer of Greek lexical models, understood by virtue of their metaphorical content, but by the pregnant approximation *ad sensum* of Greek key concepts of the logical and scientific discourse:

κατάφασις ~ *iḡāb*,

ἀπόφασις ~ *salb* (examples above, p. 249f.).

Under the same agenda, negative composites are replaced by a positive *contrarium*:

ἀδυναμία ~ *duʿf*,

ἄδηλος ~ *yahfā*,

mostly in exaggerative conjunction with the negative expression:

ἀδύνατον ~ *muhāl ḡayr mumkin*,

ἀσώματος ~ *rūhānī lā ḡirmī* (v. *ArÜbCael*, p. 78; *ProclArab*, p. 159); similarly

παρὰ φύσιν ~ *qasran*, *qasrī* (βίβλ., v. *ArÜbCael*, pp. 49, 61), *bi-l-ʿarad*, *ʿaradī* (κατὰ συμβεβηκός) beside *ḡayr ṭabīʿī*, *hāriḡ ʿan al-ṭabīʿa*, *bi-hilāf al-maḡrā l-ṭabīʿī*.

4.6.1.2. Paradigmatical

From the earliest reception of scientific professional language, indigenous Arabic words were applied to technical concepts by analogy, extension or specification of the inherent metaphors, concrete images representing abstract universals.

ḡawhar (from the Persian, ‘jewel’) never had a serious competitor as a term for ‘substance’ (Greek οὐσία), even though the Iranian Ibn al-Muqaffaʿ used a different Arabic word in his early rendering of the *Organon*: *ʿayn* (‘eye’, ‘the thing itself’). An old Arabic word, *sabab* (‘rope’), was to become the standard term for ‘cause’ instead of *illa* (not in Ibn al-Ṭayyib’s version, who like Ar^B used *illa* under the influence of his Syriac *Vorlage*).

Beginning with the early group of translators around al-Kindī, we observe the triumph of abstraction by semantic derivation. In deriving abstract terms from such metaphors of the common language, abstraction is mainly achieved by two procedures:

(a) The formation of the verbal noun, *maṣdar*, is used to convey the universal as a process;

(b) Derived from the *concreta* by the formation of abstract nouns based on the relative adjective (*-ī* > *-iyya*), the abstract is in its turn hypostatized (‘verdinglicht’).

On the one side, we find *qiyās* ‘taking measure’ > ‘analogy’, *taḡrīd* ‘stripping, peeling’ > ‘abstraction’, *iḏāfa* ‘putting next to one another’ > ‘relation’, *taṣawwur* ‘picturing, imagining’ > ‘conception’, *taṣdīq* ‘declaring as true’ > ‘judgment’.

On the other hand, a long repertory of neologisms appears in which abstract nouns are derived from pronouns and particles with the Arabic *nisba* suffix, as *mābiyya* ‘quiddity’ from *mā* ‘what?’, *kayfiyya* ‘quality’ from *kayfā* ‘how?’, imported into medieval Latin by the twelfth-century translators.

The concepts of being qua being, of ontological universals, and of the categories offered immense difficulties for which no uniform solutions were found. Our translators developed a whole system of terms to provide for the different usages of Greek εἶναι, Arabic having no copula to indicate the predicate of existence: *anniyya* for Greek τὸ εἶναι, τὸ τί ᾗν εἶναι ‘to be, being, essence’, *huwiyya* for τὸ ὄν (‘being’, *part. praes.*), *aysa* vs. *laysa* for ‘being’ vs. ‘non-being’, and *ḏāt* for ‘essence’. In the case of *huwiyya*, an Arabic word was derived from a Syriac root *hwy* (‘to be, become’). Since this was a system of concurring words, none of which was well-defined, it was superseded by a system of derivatives of a single Arabic root: *wuḡūd* (‘to be found’). Here, as in other cases, the competition between terms mirrored the competition between translators.

The copula of the Indo-European languages having no equivalent in Arabic (where the simple sentence ‘A is B’ is expressed as a nominal sentence), the translators used different words in order to express absolute ‘being’ and to differentiate ‘being’ from ‘not being’ on the one hand and from ‘coming into being’, ‘becoming’ on the other.

► Ar^B *aysa*, formed as a positive counterpart of *laysa* – another Syriac calque (Ar. *laysa*: Syr. *layt* = *aysa*: *īt*, albeit not in strict etymological correspondence), signifies ‘being’ only in opposition with ‘non-being’ (*laysa*).

Whenever the opposition ‘being’ vs. ‘becoming’ requires concise expression, **B** employs the 2nd form of the verb *kāna*: *kuwwina* ‘to be brought into being’, ‘to become’ = γίγνεσθαι, γενέσθαι, *part. pass. mukawwan* = γιγνόμενος, γενόμενος, γενητός, *nomen verbi takwīn* = γένεσις (in some instances, the derivations *mutakawwin*, *takawwun* of the intransitive 5th form, easily confounded with the 2nd form derivations, may be the original readings). This remains in use, as also in Ibn al-Ṭayyib’s version, for γενητός, ἀγένητος (*mukawwan* / *ḡayr mukawwan*).

► Ar^T *wuḡida*, *part. pass. mawḡūd*, *nomen verbi wuḡūd*) signifies ‘being’:

- in the sense of the εἶναι ‘exist’;
- in opposition to ‘becoming’ (*kāna*);
- in opposition to ‘non-being.’ The latter could be translated in verbal and adjectival syntagms with *lā yūḡad*, *ḡayr mawḡūd*, but for the substantive, τὸ μὴ εἶναι, a different concept would be used, *‘adam* = στέρησις (similarly, ἀεὶ μὴ ὄν 292 b 10 = *dā’im al-‘adam*).

4.6.1.3. Syntagmatical: Linguistic Adaption and Transposition

Simple, descriptive approximations of the processual or syntagmatical elements of the concepts conveyed by a given term sometimes yielded expressions not recognized as pregnant renderings of the underlying terminology and were discarded in the usage of demonstrative discourse, to be replaced by more adequate terms. But while the Arabic mathematicians had, from a fairly early stage of scientific writing, fully worked out sets of terms, e.g., for describing and deducing the axioms and deductions of geometry, the philosophers had not.

It is striking, for example, that the early translator of Aristotle’s *De Caelo* is unable to render the concept of ἀναλογία, using Arabic *iqtirān* (‘conjunction’) and the verb *ašbaha* (‘be similar’) instead, and that in some of the Neoplatonic texts the crucial concept of μέθεξις is rendered occasionally by a simple *fī* (‘in’), ‘A is in B’ meaning that ‘A participates in B’, in other instances by expressions with *nayl* (‘taking’), *istifāda* (‘making use of’). The degree of abstraction involved here was mastered by the translators only after the philosophers had paved the way.

For the sake of univocity, even the *concreta* of natural designations were given up in favour of a ‘scientific’, syntagmatic paraphrase, where the meaning of the term is specified through its position in an array of oppositional pairs or triads.

Thus, the early *na't* ('description') for Greek κατηγορία goes together with *hāmil* ('bearer') for the substrate, Greek υποκείμενον. The 'scientific' *maqūla* ('predicate'), derived from the root *q-w-l* ('to say') as is the Greek κατηγορία from κατηγορέω, required a different set of terms where the υποκείμενον was in Arabic *mawḍū'* ('posited [as a substrate]').

	Ar ^B	Ar ^T
κατηγορία 281 a 32	<i>na't</i>	<i>maqūla</i>
καταλέγειν κατηγορίαν 268 a 18	<i>waḍa'a ism ... wa-bihī na'ata(hū)</i>	
ἐφ' ὧν λέγεται 268 a 22	<i>al-na't</i>	

Word Formation and Derivation. — Here, most of the compositional and derivational elements of the Greek could not be rendered without admitting, in the process of transposition, divergences in quantity (dilution, amplification) and quality (notably, the substitution of grammatical categories). Nominal composites are reproduced analytically.

Thus *alpha privativum* is rendered by *ḡayr* c. gen.: ἀκίνητος ~ *ḡayr mutaharrīk*, ἄπειρος ~ *ḡayr mutanāhī*, ḡayr *al-nihāya*. Here the older translators, like Ibn al-Biṭrīq, prefer (like in the Syriac pattern) the negative particle *lā* c. acc. (general negation, *nafy al-ḡins*) and treat the syntagm as a determinate noun: ἄλογος ~ *lā nuṭqa lahū*, ἄπειρος ~ *lā nihāyata lahū*, ἀπειρία ~ *lā nihāya*, ἡ πρώτη ἀπειρία ~ *lā nihāya al-mursala al-ūlā*, τὸ ἀσώματον ~ *lā ḡirm*, οὐδέν ~ *lā šay'* (v. *ArÜbCael* [above, n. 2], pp. 59, 78).

The Greek adverb in -ως and other adverbial expressions are substituted by Ibn al-Biṭrīq and other translators of the Kindī circle by a prepositional expression *bi-naw'* c. gen.: ἀπλῶς ~ *bi-naw' mabsūt*, χρόνῳ ~ *bi-naw' zamān*, similarly ὄλως ~ *bi-qawl ḡāmi* (cf. *ArÜbCael* [above, n. 2], pp. 67, 81, 114, 121). Later translators, including Ibn al-Ṭayyib, will use the adverbial accusative of an adjective.

Verbal adjectives formed with -τός a.o., especially those with *alpha* privative, are rendered by Ibn al-Biṭrīq and other early translators by function verbs (and their participles) construed with verbal nouns: μεριστός ~ *yaqbal al-taḡzi'a*, διαιρετός ~ *qābil li-l-tafṣīl*, ἀπαθής ~ *lā yaqbal al-ātār*, likewise ἄτομος ~ *lā yaqbal al-taḡzi'a*, γενητός ~ *wāqi' taht al-kawn*, φθαρτός ~ *wāqi' taht al-fasād*, ἀναλλοίωτος ~ *lā yadhuluhu l-taḡayyur* (cf. *ArÜbCael*, pp. 165-69).

Beside, and in place of such analytical transpositions, Ibn al-Ṭayyib, in conformity with Ishāq ibn Ḥunayn and the 10th century school of Baghdad, has synthetic transposition through analogue and homologue derivation. Instead of the paraphrastic expressions given above, the part. pass. serves for rendering the verbal adjectives in -τός: γενητός ~ *mukawwan*, αἰσθητός ~ *maḥsūs* (v. *ArÜbCael*, p. 78). Here, the later translators including Ibn al-Ṭayyib are neglecting the distinction (not observed in later Greek usage already) between the part. praes. act. and other verbal adjectives, using uniformly the part. act. with intransitive verbs: γενητός ~ *kā'in*, φθαρτός ~ *fāsīd* (v. *ArÜbCael*, p. 49).

4.6.2. Expository Rhetoric: Didactic Phraseology And Demonstrative Discourse

In the field of stylistics and phraseology, we are encountering, in the translators' usage, the exegetical amplification and rhetorical ornament that are familiar not only from the manuals of ancient rhetoric, but equally from the Peripatetic and Neoplatonic commentary tradition that conveyed, along with the texts, the school tradition of teaching and interpretation. A rich repertory of phrases used for introduction, transition, summing up, underlining the evidence of the result and the stringency of the argument is deployed – just as in the oral instruction of the lecture course – where the basic text has only modal, connective and inferential particles. This remarkably elaborate phraseology

of reasoning and of presenting evidence is characteristic of a whole group of early translations, like those commissioned by or made in the environment of the scientist and philosopher al-Kindī, such as Ibn al-Biṭrīq's version of Aristotle's *De Caelo* and Ibn Nā'ima's translation of the Neoplatonic sources current under the title of the *Theology of Aristotle*.⁴⁷

But while this phraseology is common to the group of translators to which Ibn al-Biṭrīq belonged, it is not used uniformly in all of the translations attributed to him. It is true, on the other hand, that in the case of *De Caelo* such a stylistic repertory, structuring and organizing the outline and sequence of arguments, an inventory of introductory, summarizing, transitional and connecting phrases, is found not only in the early translation of Ibn al-Biṭrīq and the Kindī circle, but in the later translation of Abū l-Faraǧ ibn al-Ṭayyib as well. Since both versions of *De Caelo* are based upon the same Syriac text, it is not surprising to find a corresponding usage of such phrases, pointing generally to the common *Vorlage*, i.e. the Syriac version used by both translators. One can observe, however, that the phraseology of Ibn al-Ṭayyib is less elaborate, less fraught with emphatic hendiadys and cumbersome paraphrase.

The following are the main elements:

a) *Opening of a theme, introducing a topic or further argument and leading over to the next topic (transitus):*

ἔτι (δὲ) ..., ἀλλὰ (μὴν) ..., ... οὖν ... ~ *wa- / fa-naqūlu ayḍan* (Syriac *tūb, tūb dēn*) 'further we say ...';
fa-naqūlu ayḍan inna ..., *fa-nurīdu an naṣḥaṣa 'an* ...

• ἔτι δὲ 279 b 21

▶ Ar^B *wa-naqūlu ayḍan inna* ...

▶ Ar^T *wa-ayḍan fa-inna* ...

• λόγος δὲ καθόλου ὅδε 282 a 14

▶ Ar^B *fa-nurīdu l-āna an naqūla fī hādīhi l-ašyā'i bi-qawlin kulliyyin* ...

▶ Ar^T *fa-naqul fī dālīka qawlan kulliyyan* ...

See examples in *ArÜbCael* (above, n. 2), pp. 66-8, *ProclArab* (above, n. 19), pp. 171-3.

b) *Announcing the proof of a supposition, underlining the evidence of the present statement, and stressing the stringency of an argument:*

ἐκ τῶνδε φανερόν ~ *wa-burhānu dālīka, wa-bayānu dālīka wa-taṣḥihuhū bi-mā anā dākīrūhu l-āna*; φανερόν ~ *wa-hādā bayyinun zāhirun lā yuḥtāḡu ilā munāzaratin fīhi*.

See examples in *ArÜbCael*, pp. 63-5; *ProclArab*, pp. 174-6; 180-3.

c) *Reverting to a topic treated previously after a digression (ἄφοδος):*

ἀλλὰ (μὴν), νῦν, τοίνυν ... ~ *fa-narǧi' u wa-naqūlu, fa- (fal-) narǧi' u ilā mā kunnā fīhi (bi-sabilihī), fa-naqūlu inna* ...

See examples in *ArÜbCael*, pp. 68-9, *ProclArab*, pp. 178-80.

d) *Elaborating a fictitious or anticipated objection:*

εἰ δὲ ... λέγω δὲ ... ~ *fa-in qāla qā'ilun ... qulnā muǧībīna* ... (276 b 32 – 277 a 4, cf. Simpl., *In De Cael.*, p. 257.1-9 Heiberg *ad locum*: εἰ τις οὖν τοῦτο λέγοι, ὅτι ... εἰ τις οὖν ταῦτα λέγοι, φησί, ῥητέον αὐτῷ ...).

See examples in *ArÜbCael*, pp. 70-1, 179, *ProclArab*, pp. 183-4.

⁴⁷ See the inventories and comparative tables given in my *ArÜbCael*, pp. 63-72; *ProclArab*, pp. 171-85.

e) Validating a conclusion from established premises and returning to the thesis so proven:

ἄρα, οὖν, ὥστε ~ *fa-in kāna hādā 'alā hādā raǧā'nā fa-qulnā inna ...*; ἄρα ~ *fa-in kāna hādā 'alā dā fa-lā mahālata anna ...*, *fa-in kāna dālīka ka-dālīka fa-kāna ...*

See examples in *ArÜbCael*, pp. 69-70, *ProclArab*, pp. 174-8.

f) Back reference:

δή, δέδεικται ~ *ka-mā qulnā ānīfan*.

δέδεικται 288 a 24

- Ar^B *wa-qad bayyannā wa-awḍahñā*
 - Ar^T *fa-innā qad qulnā fi-mā salafa wa-awḍahñā anna ...*
- See examples in *ArÜbCael*, pp. 71-2, 179; *ProclArab*, p. 181.

g) Summing up, and stating the final result:

φανερὸν ἄρα ~ *fa-qadi stabāna l-āna wa-ṣahḥa anna ...*, *fa-qadi stabāna l-āna wa-ṣahḥa anna ...*, and concluding with a final 'quod erat demonstrandum': *wa-dālīka mā aradnā an nubayyin*.

ὅτι μὲν οὖν ... ἐπὶ τοσοῦτον ἤμῃν εἰρήσθω 289 a 10

- Ar^B *fa-qadi stabāna l-āna wa-ṣahḥa bi-mā qaddamnā bi-muqaddamāt wa-l-maqāyīs anna ...*
 - Ar^T *fa-qad ittadaḥa l-āna wa-bāna bi-mā dakarnā min al-muqaddamāti wa-l-maqāyīs anna ...*
- See examples in *ArÜbCael*, pp. 64-5, *ProclArab*, pp. 180-3.

4.7. Ibn al-Ṭayyib's Commentaries on Aristotle's De Caelo

4.7.1. Ibn al-Ṭayyib as a Commentator: Analytical Structure. Lexis and Theōria

The commentary work of Abū l-Faraǧ ibn al-Ṭayyib presents the most faithful continuation of the Alexandrian commentary tradition both in philosophy and in medicine.⁴⁸ The 'running commentary' (literal commentary, *commentaire continu*), the common form of philosophical instruction in late Antiquity, reflected the method of the Alexandrian lecture-course. Its characteristic features, beside the overall division into numbered lecture units (*ta'ālīm*, sg. *ta'lim*, πρᾶξις), are found in all of Ibn al-Ṭayyib's commentaries:

- The introductory *capita* (κεφάλαια) preceding each of the Alexandrian commentaries of Aristotle's works, in the school of Ammonius, fully elaborated by Olympiodorus and his disciples, as also other, such as medical, works of the school canon (for Ibn al-Ṭayyib's commentary on Aristotle's *De Caelo*, surviving only in fragments, these are not extant).

⁴⁸ See the detailed surveys and analyses by K. Praechter, "Die griechischen Aristoteleskommentare [review of *Commentaria in Aristotelem Graeca*]", *Byzantinische Zeitschrift* 18 (1909), pp. 516-38, English translation in R. Sorabji, *Aristotle Transformed: The Ancient Commentators and Their Influence*, Cornell U.P., Ithaca N.Y. 1990, Chap. 2, pp. 31-54; L.G. Westerink, *Anonymous Prolegomena to Platonic Philosophy*. Introduction, text, translation and indices, North-Holland Pub. Co., Amsterdam 1962, esp. 'Introduction,' pp. x-xxv; II. *The Alexandrian School Since Hermias*; Id., "The Alexandrian Commentators and the Introductions to their Commentaries", *ibid.*, Chap. 14, pp. 325-48; I. Hadot, "Le commentaire philosophique continu dans l'Antiquité", *Antiquité tardive. Revue internationale d'histoire et d'archéologie V^e-VIII^e s.* 5 (1997), pp. 169-76; W. Wolska-Conus, "Les commentaires de Stéphanos d'Athènes au *Prognostikon* et aux *Aphorismes* d'Hippocrates: de Galien à la pratique scolaire alexandrine", *Revue des études byzantines* 50 (1992), pp. 5-86.

- The familiar structure of the continuous commentary:

For each section, the θεωρία provides a general doctrinal analysis and discussion, while the λέξις offers an exegesis focusing on individual sentences and words.

In contrast to Ibn al-Ṭayyib's commentaries on Porphyry's *Isagoge* and Aristotle's *Categories*, the elements of his *De Caelo* comments are not presented in a single multipart exposition, but in two separate literary units:

- On the one hand, we have the Aristotelian text with marginal comments and summaries of each pericope (this is what we find in the long fragment of the Paris manuscript).

- Then, by good luck, a fragment from Ibn al-Ṭayyib's *Great Commentary*, referred to as *al-Taḥṣīn al-kabīr* in Ibn al-Ṭayyib's marginal comments and summary *taḥṣīn* of the Paris ms., has survived in three folia from the Cairo Geniza. This contains the end of his exposition of book II, and by giving the author's name, links the work with the references to *al-Taḥṣīn al-kabīr* in the summaries of the *mufassīr* intercalated in the Paris manuscript between the sections of Aristotle's text. As against the explanatory scholia, *ta'ālīq*, of the Paris ms., the *Taḥṣīn al-kabīr* provides a systematic analysis of Aristotle's positions and arguments, and concluding summaries '*alā sabīl al-ṭamara wa-l-iḥṭiṣār*' "in the way of presenting the gist in concise exposition".

The manuscript evidence is confirmed by Ibn al-Sarī, who in his testimony quoted above, p. 227, explicitly attributes to Ibn al-Ṭayyib two commentaries: "There is another commentary by this Abū l-Faraḡ without the text [i.e., the lemmata] of Aristotle's discourse, in this he reports the error [*sc.* the error found in *De Caelo* III 8 discussed by Ibn al-Sarī in his treatise] just as in his greater commentary" – calling the 'greater commentary' the one found in the Paris ms. containing text and annotation.

It is clear, however, from the references of the *mufassīr* in ms. Paris, recapitulating the preceding sections, where Ibn al-Ṭayyib himself refers to "our great commentary" at several instances (*taḥṣīrunā l-kabīr*, fol. 104a, 105b, 115b, 120b, etc.), that this one is the *theōria* preserved in the Geniza fragments. He also mentions (fol. 109a and 111b) his own *taḥṣīn li-Qāṭiḡūriyās*, a literal commentary on the *Categoriae*; here, Abū l-Faraḡ ibn al-Ṭayyib's commentary is indeed extant (as also his *Taḥṣīn k. Īsāḡūḡī*, on Porphyry's *Isagoge*), and the relevant references can be identified in their proper places.⁴⁹

4.7.2 Text and Taḥṣīn

4.7.2.1 Divisions of the annotated text

The Aristotelian text (*lemmata* introduced by *qāla Aristūṭālis*) is divided, as in every other commentary work of Abū l-Faraḡ ibn al-Ṭayyib, into lecture units, Arabic *ta'lim* (Greek *περὶ λέξις*). Book I of *De Caelo* contains 16 such chapters, *ta'ālīm*, the extant parts of Book II are from *ta'lim* 1 to 5. References to *al-Taḥṣīn al-kabīr* show that this was divided into identical units of *ta'ālīm*. The *ta'ālīm*, again, are divided into shorter pericopes, explained sentence by sentence, sometimes word by word, in the marginal scholia. Each pericope is followed by a short summary comment, introduced by the words *qāla l-mufassīr*, of the preceding lemma. In this, the commentator gives the result of the argument (*ḥuḡḡā*) and characterizes the demonstrative procedure – *bayān* 'explanation', *bayān ḡadalī* ('dialectic demonstration'), *burhān* ('demonstrative proof'), solution of an aporia (*ṣakk*). Here is a survey of the pericopes and the comments given:

⁴⁹ Ed. Ferrari, as quoted above, p. 229, see references given below, p. 261.

- Book I, *ta'lim* 13 = *De Caelo* I 9, 277 b 27 (? – fragment starting at 279 a 3) to 279 b 3 (fol. 110a-112b): There cannot be more than one world.

Pericope extending from ca. 279 a 2 (fragment beginning at 279 a 3) to 279 a 5.

Closing *Tafsīr*: “This is the argument (*ḥuḡḡa*) showing that the entire matter is in this world”.

Pericope I 9, 279 a 6-10 (om. 10-11 ἀλλ’ εἷς καὶ μόνος καὶ τέλειος οὗτος οὐρανός ἐστιν).

Closing *Tafsīr*: “This is the result of the discourse” (*sc.* proving that there are not, nor were nor will be, many worlds).

Pericope I 9, 279 a 11 – 279 b 3: There is no place outside of the heaven, nor void nor time.

Closing *Tafsīr* points out the result of “what follows the preceding exposition (*bayān*) that the world is one, *sc.* that outside the world there is no body, no place, no void, and no time”.

- Book I, *ta'lim* 14 = *De Caelo* I 10, 279 b 4 – 280 a 34 (fol. 112 b - 119 b): Opinions on the duration of the world, if it is eternal, ungenerated or generated, imperishable or perishable.

Pericope I.10: 279b4 - b17: The problem under discussion and previous views.

Closing *Tafsīr*: “He [Aristotle] imposes upon himself to investigate the issue of the world, if it is generable (*kā'in*) or ungenerable, perishing (or: perishable, *fāsīd*), or imperishable, and before this, he enumerates the opinions of the Ancients”.

Pericope I 10, 279 b 17-21: To say that the world is generable, yet is imperishable and unending, is impossible.

Closing *Tafsīr*: A refutation of this opinion “based on induction (*istiqrā'*) from how things are” (b 19 ὅσα ἐπὶ πολλῶν ἢ πάντων).

Pericope I 10, 279 b 21-31: What has no beginning, cannot change; to have a beginning implies change, then the world will not be imperishable.

Closing *Tafsīr*: “This exposition, showing that the world, being generable, must perish, is made by analogy (*bi-ṭariq al-qiyās*)”, closing with reference to a commentary given “at the beginning of the lecture in the *Great Commentary*” *fi ṣadr al-ta'lim min al-tafsīr al-kabīr* (f. 115b).

Pericope I 10, 279 b 32 – 280 a 2: Against justifying the [Platonic] account of generation in terms of a geometrical model (ὁμοίως ... τοῦς τὰ διαγράμματα γράφουσι, Ar^T: *kamā anna l-muhandisīna yaf'alūna fi l-aškāli l-murakkabati min ḥutūt in kaṭīratin ... aṣḥābu l-handasati*), not a physical process.

Closing *Tafsīr*: This is the argument used by the adherents of Plato in defense of his tenet that the world is generated (*sc.* in time, *muhdat*).

Pericope I 10, 280 a 2-11: Refutation of the geometrical model of generation where the elements of a construction, order and disorder exist simultaneously, this being incompatible with an everlasting world.

Closing *Tafsīr*: “This is part of the argument (*ḥuḡḡa*) they put forward on behalf of Plato and his tenet that the world is generable, opining that he was conceiving this as ‘becoming’ in the mind, not in existence”.

Pericope I 10, 280 a 11-23: Against the theory of alternating constitution and dissolution of the world.

Closing *Tafsīr*: “He refutes the word of those who say that it (the world) comes into being at one time and perishes at another time, and that this succession will not end”.

Pericope I 10, 280 a 23-28: Against the atomist theory of one of several worlds coming to be and perishing once only, “and we shall explicate later if this is possible or not”.

Closing *Tafsīr*: Explicating the foregoing announcement: “He means the doctrine that the world comes into being all at once and then perishes, and will not return a second time”.

Pericope I 10, 280 a 28-34: Announcing to examine the doctrine of the *Timaeus* (Plato is not named neither in Greek nor in the Arabic version), *viz.* that the world comes into being, but will continue eternally for the rest of time, unending and imperishable. “They maintained this tenet at random” (φουσικῶς : *ka-mā ttafaqa* Ar^T [a loose rendering of Syriac *kyānā it?*] – Ar^B has: *bi-qawlin ṭabī‘iyin*).

Closing *Tafsīr*: Restating the basic dilemma – some pretend that a thing may be generated but will not perish, and others say that there is something ungenerated that may perish, “and we will revert to investigating the truth of the matter, in good order (*‘alā ṭarīq al-qānūn*), tomorrow. And here ends the lecture”.

- Book I, *ta‘līm* 15 = *De Caelo* I 11, 280 b 1 – 281 b 18 (fol. 99a – 106b): Analysis of the terms ‘ungenerated’ and ‘generated’, ‘perishable’ and ‘imperishable’, ‘possible’ and ‘impossible’. A thing cannot have a capacity for opposites at the same time.

Pericope I 11, 280 b 1-6: Ungenerable *vs.* generable, perishable *vs.* imperishable.

Closing *Tafsīr*: Aristoteles imposes upon himself to study the implications (*muzāwaḡa* ‘pairing’) of generable/coming-to-be (*kā’in*) & perishable (*fāsīd*), ungenerable (*ḡayr kā’in*) & imperishable (*ḡayr fāsīd*), and to begin with, to enumerate the significations of these words.

Pericope I 11, 280 b 6 – b 20: Ungenerable *vs.* generable.

Closing *Tafsīr*: This is an enumeration of the several uses of these words.

Pericope I 11, 280 b 20 – 281 a 1: Perishable *vs.* imperishable.

Closing *Tafsīr*: He enumerates the various significations in order to specify the meanings intended in the present context.

Pericope I 11, 281 a 1-19: The meaning of ‘possible’ (*li-l-šay’ quwwa* ‘having power’) *vs.* ‘impossible’ (*laysa labū quwwa* ‘not having power’).

Closing *Tafsīr*: He defines ‘strong’ *vs.* ‘weak’ power in respect to the limit (*ḡāya*) or falling short of a limit.

Pericope I 11, 281 a 19-27: A difficulty arising from the definition of capacity with respect to a maximum limit.

Closing *Tafsīr*: For the solution of this aporia (*ḡall al-šakk*), reference is made to the first part of the lecture in the *Great Commentary* (*šadr al-ta‘līm min al-Tafsīr al-kabīr*).

Pericope I 12, 281 a 28 – b 2: The capacity that a thing obtains to be or not be for a limited time of either state.

Closing *Tafsīr*: He excludes that for one thing, there may be the capacity for two contraries during an unlimited time. Reference is made to the first part of the lecture in the *Great Commentary* (*šadr al-ta‘līm min al-Tafsīr al-kabīr*).

Pericope I 11, 281 b 2-18: The distinction between false (*kaḏīb*) and impossible (*muḡāl*, ‘absurd’).

Closing *Tafsīr*: He differentiates between the false and the absurd (*muḡāl*), the possible and the impossible. End of *Ta‘līm*.

- Book I, *ta'lim* 16 = *De Caelo* I 12, 281 b 18 – 282 b 2 (fol. 106b-108b, 89a-91a): That which is for ever cannot be for a certain time only, thus it is not generated; the ungenerated and the imperishable are one, and co-extensive with the existent (*yatawassaṭ al-mawḡūd*, closing *tafsīr*, f. 91a).

Pericope I 12, 281 b 18-34: One and the same thing cannot be capable of opposites, viz. both of being always and of not-being always.

Closing *Tafsīr* gives a fairly lengthy summary of the argument demonstrating that “it is impossible that a thing has potency for two opposites in infinite time”.

Pericope I 12, 281 b 34 – 282 b 2:

Tafsīr at the end of *ta'lim*: “It has been made clear that the ungenerated and the imperishable are one, co-extensive in regard of (‘in the midst of’) the eternally existent (*tabayyana anna ḡayru l-kā'ini wa-ḡayru l-fāsidi humā wāḥidun yatawassaṭu l-mawḡūda dā'imān*) ...”, closing with a reference that “we have commented upon this at the beginning of the lecture in our *Great Commentary*” (*ṣadr al-ta'lim min al-Tafsīr al-kabīr*) (f. 91a6).

- Book I, *ta'lim* 17 = *De Caelo* I 12, 282 b 2 – 283 b 7 [? ms. fragment ending with 283 a 30, before lacuna] (fol. 91a-98b, 120a-b): The ungenerated and the imperishable imply (‘follow’) each other: supposing the potency of not-being and that of being to coexist for an indefinite time is absurd.

Pericope I 12, 282 b 2-23: Imperishable implies ungenerated.

Closing *Tafsīr* indicates “*bayānu hādā huwa l-bayānu ‘alā anna l-kā'ina yatba'u l-fāsida li-annahumā naqīdāni li-ḡayri l-kā'ini wa-ḡayri l-fāsidi, wa-hādāni yatalāzamāni, fa-dālika bi-hādīhi l-ṣifati, wa-bayānuhū li-mā nubayyinuhū min dālika yatawassaṭu l-mawḡūda fi ba'ḍi l-awqāti l-ma'dūma fi ba'ḍi l-awqāt*”.

Pericope I 12, 282 b 23 – 283 a 3 + *additamentum*:

Both versions add to 282 a 3 a longer gloss: After the relations Z & Θ, E & Z, H & Θ, E & H have been considered, the relations are arranged in a somewhat more systematic order E & Z, H & Θ, Z & Θ, E & H, followed by the explanation of which matters are designated respectively by the abstract symbols.

Closing *Tafsīr* indicates *bayān* “*‘alā anna l-kā'ina yatba'uhū l-fāsidi wa-l-fāsidi yatba'uhū l-kā'in*” [etc.].

Pericope I.12, 283 a 4-17: Generated implies destructible, indestructible implies ungenerated. First and second argument.

Closing *Tafsīr*, stating the preceding “summary explanation” (*al-bayān al-muḡmal*).

Pericope I 12, 283 a 17-20: Third argument.

Closing *Tafsīr* points out the principle (*aṣl*) repeated here.

Pericope I 12, 283 a 20-24: Fourth argument.

Closing *Tafsīr* points out the logical implication (*ilzām*).

Pericope I 12, 283 a 24-29: The destructible must at some time perish.

Closing *Tafsīr* summarizes the preceding *huḡḡa*, and refers to a detailed commentary given at the beginning of the respective *ta'lim* in his *Tafsīr al-kabīr*.

Pericope I 12, 283 a 29 – b 6 [lacuna in ms. after fol. 120, 283 a 30 ἄγένητον – b 7 ὅτι νῦν ἔστιν].

- [Book I, *ta'lim* 18, division lost in lacuna] = *De Caelo* I 12, 283 b 6 [?]–22 [extant text 283 b 7–21 only] (fol. 121, 124): It is impossible that the ungenerated be perishable, or that the imperishable be generated, because if there was in it a potency to perish, this potency cannot be both realized and not realized with respect to a past state.

Pericope I 12, 283 b 6

Closing *Tafsir* summarizes “hādīhi l-ḥuḡḡatu l-āḥīratu llatī yubayyinu bihā annahū ḡayra mumkinin an yakūna l-šay’u ḡayra kā’inin fāsīdan wa-lā ḡayra fāsīdin kā’inan”.

Pericope I 12, 283 b 11: ἔστω δὴ ... ἐνεργεία

Closing *Tafsir* defines the doubt (*šakk*) raised on the potency for and actuality of opposite states.

Pericope I 12, 283 b 12–17

Closing *Tafsir* on the solution of the aporia raised in the last paragraph (*hādā huwa ḥall al-šakk ...*), concerning the impossibility of a potency for opposites to be realized simultaneously.

Pericope I 12, 283 b 17–22 [lacuna, 283 b 21–22 καὶ ὑπὸ τῶν αὐτῶν τούτων φθείρεται]: It is physically impossible for what is eternal *a parte ante* to perish later, and v.v. (καὶ φυσικῶς δὲ καὶ μὴ καθόλου σκοποῦσιν: Ar^T “exposing [this error] by induction from the physical things, not by demonstration, as we did before” (*bi-l-istiqrā’i mina l-umūri l-ṭabī’iyyati lā bi-l-qiyāsi kamā fa’alnā fī-mā salafa*, cf. above, *Tafsir* on 272 b 19).

[*Tafsir* lost in lacuna].

¶ The extant part of Book II starts with the second pericope of *ta'lim* 1:

- Book II, *ta'lim* 1 = *De Caelo* II 1 [283 b 26–30 missing due to the loss of 2 folia, 283 b 30 – 284 b 5, II 2, 284 b 6 – 285 a 1 (fol. 73–78) [285 a 2–16 lost in lacuna of 2 folia], 285 a 16–31 (fol. 109) [285 a 31 – 286 a 2 lost in lacuna of 2 folia].

Pericope: *De Caelo* II 1 [283 b 26]– 284 a 2: resumé of the proofs, closing Book I (Ch. 8–12), that the heaven has neither come to be nor will perish.

Tafsir summarizing Aristotle’s *bayān* that the heaven is ungenerable and imperishable.

Pericope II 1, 284 a 2–11: The belief of the Ancients in the eternity of the noble, encompassing heaven.

Tafsir summarizes *bayān* of the heaven being ungenerated in regard of the views of the Ancients.

- Book II, *ta'lim* 2 = *De Caelo* II 3 [286 a 3–17, lost in lacuna], 286 a 17 – b 7 (fol. 122–123) [286 b 7–9 lost]: Motion and rest in the universe. The heavenly eternal movement must be circular; there must be a centre at rest, namely earth, and its contrary, fire, and the corresponding movements, and there are several revolutions of the celestial bodies.— II 4: [286 b 10 – 287 a 22 lost in lacuna of 2 folia], 287 a 23 – b 21 (fol. 63–65): The shape of the heavenly body is spherical.

Pericope ending at 287 a 30.

Tafsir on II 4, 287 a 30: *al-ḥuḡḡa al-ṭālīṭa fī anna šakl al-samā’ kuri* “the third argument proving that the shape of the heaven is spherical” (f. 63b).

- Book II, *ta'lim* 3 = *De Caelo* II 5, 287 b 22 – II 6, 289 a 10 (f. 65b ult.–80.11): The rotation of the sphere of the fixed stars is from right to left. It is perfectly regular.

Pericope II 5, 287 b 22 – 288 a 12.

Tafsīr summarizing the result of the argument: “He gives the cause for which the sphere of the fixed stars moves from the Eastern point forwards, and not from the Eastern point backwards, and so rises above us from the direction of the West”.

Pericope II 6, 288 a 13-27: The movement of the heaven is perfectly regular.

Ta'liq on II 6, 288 a 19 (regularity of the circular movement). Cross-reference to the initial part of the lecture in the *Great Commentary* (*'alā mā šarahñā fi šadr al-tā'lim min al-tafsīr al-kabīr*, f. 69 b 7).

Pericope II 6, 288 a 27 – b 6: Irregularity in the circular movement is neither caused by the heaven itself nor by the mover.

Tafsīr following II 6, 288 a 27: “First explanation” (*hādā l-bayān al-awwal alladī yubayyin bihī anna ḥarakat falak al-kawākib al-tābita mustawiya*). Closing reference to the “initial part of the lecture in the *Great Commentary* (*šadr al-tā'lim min al-tafsīr al-kabīr*)” (f. 69b)”.
Tafsīr following II 6, 288 b 6: “hādā l-bayān al-tānī fi anna ḥarakat falak al-kawākib al-tābita wāḥida mustawiya”, closing with a reference to the *Great Commentary*: *wa-qad šarahñābu fi šadr al-tā'lim min al-tafsīr al-kabīr* “and we have commented upon this at the beginning of the *tā'lim* of the *Great Commentary*” (f. 70b).

Tafsīr following II 6, 288 b 30: *hādā l-bayān al-rābi'*, with a reference to the exposition at the beginning of the *Great Commentary* (f. 79a).

Tafsīr following II 6, 288 b 30: *hādā l-bayān al-rābi'*, with a reference to the exposition at the beginning of the *Great Commentary* (f. 79a).

- Book II, *tā'lim* 5 = *De Caelo* II 8, 290 a 29 – b 11 (fol. 87b pu.-88b11); II 9, 290 b12 [breaking off after φανερόν δ' ἐκ τούτων = *wa-zāhirun mimma qulnā*] (f. 88b ult.): The stars having no organ for movement, they have no self-movement.
- Book II, *tā'lim* 4 = *De Caelo* II 7, 289 a 11-35 (fol. 80b11-82b2): The nature of the stars is that of the heavenly body in which they exist; albeit emitting heat and light, they do not consist of fire. — II 8, 289 b 1 – 290 a 29 (fol. 80b11–87b apu.): The motion of the stars: The sphere moves, while the stars are at rest, having no movement of their own.

Pericope 290 a 13-24. The movement of the stars.

Tafsīr following II 8, 290 a 13-24: Solution of the aporia (*ḥall al-šakk*): The stars are not self-moving independently of their spheres.

- Book II, *tā'lim* 5 = *De Caelo* II 8, 290 a 29–b 11 (fol. 87b pu.-88b11); II 9, 290 b12 [breaking off after φανερόν δ' ἐκ τούτων = *wa-zāhirun mimma qulnā*] (f. 88b ult.): The stars having no organ for movement, they have no self-movement.

Pericope II 8, 290 a 29 – b 11: The stars have no organ for movement.

Tafsīr following II 8, 290 b 11: This is the second, dialectical explanation concerning the motion of the stars (*hādā l-bayān al-tānī al-ḡadalī*).

Pericope II 9, 290 b 12 [breaks off after 290 b 12 φανερόν δ' ἐκ τούτων = *wa-zāhirun mimma qulnā*]

In his annotation to *De Caelo* I 9, 279 a 30 ἐν τοῖς ἐγκυκλίοις φιλοσοφίμασι, the author refers to his *Tafsīr li-Qāṭiḡūriyās*, where the exoteric writings of Aristotle are defined in the context of the general *Prolegomena* to Aristotle's work, v. Ferrari (ed.), *Der Kategorienkommentar von Abū l-Faraḡ 'Abdallāh ibn aṭ-Ṭayyib* (above, p. 229), Arabic text, p. 13.18-25: “lammā kānat kutub Aristūṭālis tanqasim ilā qismayn, ilā l-zāhira wa-l-ḥafiyya, waḡaba an takūn šurat kalāmihī 'alā ḍarbayn, zāhir wa-ḥafiyy, ammā l-zāhir fa-bi-manzilat rasā'ilihī wa-kutubihī l-ḡadaliyya, fa-inna hādihī l-kutub ista'mala fihā zuhūr al-mā'ānī wa-wuḍūḥ al-alfāz”. — In his *commentum* on *De Caelo* II 2, 284 a 22 πολλαχῶς λέγεται τὸ πρότερον, Ibn al-Ṭayyib points to the section on πρότερον/ὑστερον, *Cat.* 12, 14 a 26 - b 23, but without referring to his own commentary (cf. *Tafsīr kitāb al-Qāṭiḡūriyās*, ed. Ferrari, p. 389ff. [*theoria*], 395ff. [*praxis*]).

4.6.2.2 *Ibn al-Ṭayyib's Marginal Annotation (ta'liq)*

As a specimen of Ibn al-Ṭayyib's annotation accompanying his own translation of *De Caelo*, here is the passage from *De Caelo* I 9 on the transcendent beyond (τάκεῖ), the realm of αἰών "ἀθάνατος καὶ θεῖος", already presented above, § 4.5.2, pp. 240-6, for our comparison between the versions of Ibn al-Bīṭrīq and Ibn al-Ṭayyib:

[279 a 16] Φανερόν ἄρα ὅτι οὐ-[279 a 18]τε τόπος οὔτε κενόν οὔτε χρόνος ἐστὶν ἔξω. Διόπερ οὐτ' ἐν τόπῳ τάκεῖ πέφυκεν, οὔτε χρόνος αὐτὰ ποιεῖ γηράσκειν, οὐδ' ἐστὶν οὐδενός οὐδεμία μετα-[279 a 20]βολῆ τῶν ὑπὲρ τὴν ἐξωτάτω τεταγμένων φορᾶν, ἀλλ' ἀναλλοίωτα καὶ ἀπαθῆ τὴν ἀρίστην ἔχοντα ζῶην καὶ τὴν αὐταρκεστάτην διατελεῖ τὸν ἅπαντα αἰῶνα. (Καὶ γὰρ τοῦτο τοῦνομα θεῖως ἐφθεγκται παρὰ τῶν ἀρχαίων. Τὸ γὰρ τέλος τὸ περιέχον τὸν τῆς ἐκάστου ζῶης χρόνον, οὐ μὴθὲν ἔξω κατὰ φύσιν, αἰὼν ἐκάστου κέκληται. Κατὰ τὸν αὐτὸν δὲ λόγον καὶ τὸ τοῦ παντός οὐρανοῦ τέλος καὶ τὸ τὸν πάντα χρόνον καὶ τὴν ἀπειρίαν περιέχον τέλος αἰῶν ἐστὶν, ἀπὸ τοῦ αἰεὶ εἶναι τὴν ἐπωνυμίαν εἰληφώς, ἀθάνατος καὶ θεῖος). Ὅθεν καὶ τοῖς ἄλλοις ἐξήρτηται, τοῖς μὲν ἀκριβέστερον τοῖς δ' ἀμαυρῶς, τὸ εἶναί [279a30] τε καὶ ζῆν.

Καὶ γὰρ, καθάπερ ἐν τοῖς ἐγκυκλίσι φιλοσοφήμασι περὶ τὰ θεῖα, πολλάκις προφαίνεται τοῖς λόγοις ὅτι τὸ θεῖον ἀμετάβλητον ἀναγκαῖον εἶναι πᾶν τὸ πρῶτον καὶ ἀκρότατον· ὃ οὕτως ἔχον μαρτυρεῖ τοῖς εἰρημένοις. Οὔτε γὰρ ἄλλο κρεῖττόν ἐστὶν ὃ τι κινήσει (ἐκεῖνο γὰρ ἂν εἴη θεϊότερον) οὔτ' ἔχει φαῦλον οὐδέν, οὔτ' ἐνδεές τῶν αὐτοῦ καλῶν οὐδενός ἐστὶν.

[279 b 1] Καὶ ἄπαστον δὴ κίνησιν κινεῖται εὐλόγως· πάντα γὰρ παύεται κινούμενα ὅταν ἔλθῃ εἰς τὸν οἰκεῖον τόπον, τοῦ δὲ κύκλω σώματος ὃ αὐτὸς τόπος ὅθεν ἤρξατο καὶ εἰς ὃν τελευτᾷ.

Arabic translation, ms. Paris, BnF, arabe 2281, f. 111 a 1 – b 10, with Ibn al-Ṭayyib's marginal annotations (*ta'ālīq*)

[279a16] We have explained in what precedes that outside the heaven there is no body, and it is impossible that there should be any body at all. And if this the case, it is clear and evident that there is no place nor void nor time outside of the heaven.	No annotation (<i>ta'liq</i>) on this passage.
[a18] Therefore, what is there is not in a place,	Meaning: the encompassing sphere.
[a19]and it is impossible that time should cause it to age,	Meaning: to count its number and to add to it.
and it is impossible for the encompassing body to change or to alter at all,	Meaning: because to its form there is no opposite, as explained, and it is not moved from one state to another.
[a21] but is stable and unchanging, and does not receive any affection.	That is to say: because to its form there is no opposite.
[a21-2] Indeed, its life is stable, enduring for eternity (<i>dahr, αἰών</i>), living in the best of ways.	That is to say: because its form will never be separated from its matter.

[a22-3] Therefore, the Ancients were right in coining the name of <i>dabr</i> , driving home the point fully	No annotation (<i>ta'liq</i>) on this passage.
[a23-4] by saying that the time encompassing the life of each one of the beings having life,	Meaning: (the time) that counts the time of every one and divides it (ms. <i>yufadḍiluhū</i> : leg. <i>yufaṣṣiluhū</i>).
[a24] there being no other natural time after it,	Meaning: There is no time close to it nor surpassing it.
is the perpetual eternity (<i>al-dabr al-abadī</i>).	That is to say: The eternity (ὁ αἰών) takes up the time in its (whole) extension without there being in it anything preceding or succeeding.
[a26-7] Therefore we say that the sphere is encompassing all of time, which is the eternity.	That is to say: Because the eternity is the measure (<i>iḥṣā'</i> , counting) of its movement.
[a27-8] Actually, this name is derived from its activity, since this (<i>al-dabr</i>), is lasting for ever unto eternity, divine and immortal.	Meaning: It was given this name, stating that it is encompassing all of eternity because its activity is perpetual.
[279 a 29] It is closer in relation to some things,	Meaning: To the planetary spheres since it is adjacent to them.
and to other things, more remote.	That is to say: Like the elements and the bodies of the animals and plants.
[279 a 30] We have mentioned in our books on the exoteric philosophy, i.e those we have written for the public (<i>al-amma</i>)	Mention of this has been made in our commentary on the <i>Categoriae</i> , where we have said which these books are, and that these are the books [using] dialectical [arguments] (<i>al-kutub al-ḡadaliyya</i>). ⁴⁹
[a32] and have stated that this spiritual entity must not change nor perish by necessity,	Meaning: because its substrate does not involve privation (<i>'adam</i> , non-being) since it is absolute form.
because it is the cause of all that comes after it in respect of its world (<i>min 'alamihī</i> , leg. <i>min 'ilalihī</i> 'its causes'? cf. <i>versio B</i>),	Meaning: since it is the agent cause for what comes after it.
and there is not after it another cause.	Meaning: because its form is unseparable from its matter, being in the best of modes.
[a33] It is of the quality that we have stated, it does not undergo alteration nor change, it is complete and perfect, lasting until eternity, divine, and evil will not approach it,	Meaning: because it is independent (<i>mustaqill</i> , αὐτάρκτης), not in need of what is beyond it.

⁴⁹ See Abū l-Faraḡ ibn al-Ṭayyib, *Tafsīr kitāb al-Qāṭiḡūriyās*, pp. 399ff., 395ff. Ferrari.

[a33–4] nor is it in need of any good of which it is the cause,	Meaning: since it is governing everything, and there is no other thing governing itself.
and there is not above it another cause by which it would be caused in that this would be moving it.	That is, exercising natural government, since above the sphere of the fixed stars there is no other sphere preceding it but the First Cause, in fact this movement is a natural movement.
[279a34] And if there should be another cause, this as well would be stable, steady and eternal, and there would not be beyond it something more excellent (κρεῖττον).	Meaning: if it should turn out that a cause is preceding it, the same description would apply to it, and no other (cause) would precede it.
[a35] Further, this – i.e., this spiritual body – does not receive any affection (πάθος, for φαῦλον),	Meaning: because it has no opposite, and change occurs in opposites.
[279b1] and its movement is eternal and unending.	Meaning: because its form is eternal and stable.
It is by necessity that this movement belongs to it,	Meaning the perpetual (movement) that has no ending.
[b1–2] because in all things, their movement comes to rest once they arrive at their (proper) places;	Meaning: when they are outside of their (proper) place, and they return until they reach their [...]. ⁵⁰
[b2–3] but as for this superior, noble body, its movement does not come to rest at all,	Meaning: because its form is one and does not weaken.
[b3] because at the starting point (mabda', ἀρχή) from which the movement starts, it will also cease,	Meaning: it takes off from one point and returns to it since its movement is circular.
and therefore its movement will be perpetual.	Meaning: because there is no limit to it at which it should halt.
<i>The Commentator says:</i>	
This is what follows the explanation that the world is one; viz. that outside of the world there is neither body nor place nor void. And here ends our lecture.	

⁵⁰ Lacuna, last word cut off in the binding.

4.7.3. Ibn al-Ṭayyib's Tafsīr kitāb al-Samā'

4.7.3.1 Character and Identity

Like in Ibn al-Ṭayyib's extant commentaries on Aristotle's *Categories* and Porphyry's *Isagoge*, a literal commentary – the λέξις of the Greek commentary-lecture – provides, for each section, an exegesis focusing on individual sentences and words. In the case of *De Caelo*, however, Ibn al-Ṭayyib's own translation was combined with the literal exposition in the first instance, given in the form of marginal notes. Then, the *Great Commentary*, *al-Tafsīr al-kabīr*, gave the exegesis of Aristotle's doctrine and argument, i.e. the θεωρία part of the commentary was given separately, possibly as a separate codicological unit.

4.7.3.2 The Manuscript

The surviving fragment of the *Tafsīr* provides a specimen of three connected leaves, including the end of Book II, with an *explicit* giving the title and author's name. Apart from the author's self-references in the *ta'ālīq* of the Paris fragments (acephalous, hence *a priori* anonymous), we have no other testimony apart from the meticulous and significant report of Ibn al-Sarī, and a summary mention found in the report on Ibn Sīnā's shopping list of books recovered from Baghdad (v. *supra*, § 4.2.1, p. 230).

Ms. Cambridge University Library, T.-S. Ar. 40.18. Three papyrus folia. Coarse *nashī* writing, unvocalized and almost completely undotted. This fragment of the *Great Commentary* was identified by Y. Tzvi Langermann in the Taylor-Schaechter collection of manuscript pieces from the Cairo Geniza, "Transcriptions of Arabic Treatises into the Hebrew Alphabet: an underappreciated mode of transmission", in *Tradition, Transmission and Transformation. Proceedings of Two Conferences on Pre-modern Science held at the University of Oklahoma*, ed. by F.J. Ragep and S.P. Ragep with S. Lindsay, Brill, Leiden [etc.] 1996 (Collection des travaux de l'Académie internationale d'Histoire des sciences, 37), pp. 247-62, v. pp. 252f.⁵²

Expl. f. 3b:

ينقضي التعليم والمقالة الثانية من كتاب السماء
تفسير الشيخ الفيلسوف الفاضل أبي الفرج عبد الله بن الطيّب رضي الله عنه
على طريق الثمرة والاختصاره

End of the lecture, and of the second treatise of the *Book on the Heaven* with commentary of the excellent master, the philosopher Abū l-Farağ 'Abdallāh ibn al-Ṭayyib, may God be pleased with him, using the method of *tamara* and abridgement.

The term *tamara* ('fruit', i.e. 'core, gist of the matter'), and the verbal noun *istimār* ('harvesting, reaping the crop, exploitation'), are familiar from Ibn al-Ṭayyib's summaries (*ṭimār*, *tamara*) of the works of Galen and other Greek authors.⁵³

⁵² I want to express my gratitude to Professor Langermann who first informed me of this important finding, and put at my disposal his own transcription of the Arabic text.

⁵³ See the list of his writings in Ferrari, *Der Kategorienkommentar* (above, p. 229), pp. 34-42.

4.7.3.3 Contents and structure

The fragment covers *De Caelo* Book II, Chapter 14, treating two topics: (a) The place of the earth —The earth is at rest in the center of the cosmos (296 a 25 – 297 a 6); (b) The earth is spherical in shape 297 a 6 – 298 a 20), including some points of the doxography of chapter 13. A characteristic of Ibn al-Ṭayyib's commentaries, known from his extant *Tafsīr* of Aristotle's *Categoriae* and Porphyry's *Isagoge*, is the systematic analytical structure, dividing, defining and sorting Aristotle's arguments, the steps taken for investigating a topic (*maṭlab*, ἐπιχειρήματα), classifying the proofs (*huǧǧā*), and the objections and problems to be solved (*šakk*, 'doubt', ἀπορίαι), evaluating the strength of his expositions in terms of explanation (*bayān*), demonstration (*burhān*) and dialectical proof (*burhān ǧadālī*).

Distinctive of his method is the reduction of each topic to the elements of logical procedure. This goes back to his predecessors of the Baghdad school of translators and transmitters of Aristotle's logic. On the one hand, we have the recasting of the propositions and arguments in terms of the figures of the syllogism; on the other hand, the reasoning and the evaluation of the underlying principles follow the fundamentals of Aristotle's *Analytica Posteriora* (in Arabic, *Kitāb al-Burhān*). The belief that each science, universal or particular, is resting on its own principles and following its specific basis in demonstrating fact and reason (*An. Post.* II 27-28) is transparent in the very outline of our chapter where Ibn al-Ṭayyib divides the arguments between those of 'the metaphysician' (*al-ilāhī*) on the one side and the 'physical scientist' (*al-ṭabī'ī*) on the other.

It may have been the pedantry of his numbered catalogues of topical divisions, not all of them easily applicable to the Aristotelian text, which Ibn Sīnā found so exasperating. Nevertheless, Ibn Sīnā's hierarchical divisions of his *summae* of philosophy and medicine may well have been inspired in a way by this faithful continuator of the Greek commentary tradition. Even more clearly Ibn Rušd was influenced by his predecessor, although he rarely admits to having consulted him (see § 4.2.3, pp. 230-33). The analytical structure of the *Middle Commentary* on *De Caelo* (*Talḥiṣ al-Samā' wa-l-'ālam*) with its fine division into numbered units of *ǧumla* and *maṭlab*, *faṣl* and *qism*, topics of *bayān*, *šakk*, and *burhān* breathes the same obsession with the science of demonstration.⁵⁴

⁵⁴ Ed. Ğ. al-'Alawī (Fās 1984); for the *Middle Commentary* of the *Physica*, see Ğ. al-'Alawī, "Min Talḥiṣ al-Samā' al-ṭabī'ī: taqṣīm al-Samā' al-ṭabī'ī li-Ibn Rušd", *Maǧallat Kulliyyat al-Ādāb wa-l-'ulūm al-insāniyya bi-Fās, Ğāmi'at Sīdī Muḥammad b. 'Abdallāh* 7 (Fās, 1983/84), pp. 205-55 – here only the table of contents, presenting a very similar structure, is preserved in Arabic.

كذا في كتابها ما لعله لم يدركه في كتابه الاول
 وما هو هذه الصفة اعني في كتابه هو مساه
 ولاها ارضه و الارض لغير المنادي والعاتاب
 وهكذا الوارثه ورجلها سكله . والطبعي
 قول الارض في الابعاد نحو قوله على الماده
 والحس في كل لوسون في الالف والواو
 الحونه بالمرحوم وراه ولا في الارض في قوله
 مع الذكره وبعضه العلم والمفاهيم الثالثه
 في كتابه في السبع السبع الفيلسوف المعامل
 في المخرج عند الله الطبع في الله على طبع
 المبره والاحصاء
 ولولاه العمل في كتابها
 وصلى الله على سيدنا محمد وآله الطاهرين
 وهو بيان هو الولد

[Fifteen arguments for the earth being at rest in the centre of the cosmos]

[... Concerning the earth being at rest in the center, this will be made clear by fifteen arguments:]

Fifth argument: The earth descends by its nature. If it were a star (residing) in the ether, it would be in a place outside [i.e. contrary to] its nature.

Cf. II 14, 296 a 25-30 οἱ μὲν αὐτὴν ἐν τῶν ἄστρον εἶναι ποιοῦσιν ... Ὅτι δ' ἐστὶν ἀδύνατον, δῆλον λαβοῦσιν ἀρχὴν ὡς εἴπερ φέρεται εἴτ' ἐκτὸς οὐσα τοῦ μέσου εἴτ' ἐπὶ τοῦ μέσου, ἀναγκαῖον αὐτὴν βία κινεῖσθαι ταύτην τὴν κίνησιν· οὐ γὰρ αὐτῆς γε τῆς γῆς ἐστίν.

Aristotle's first argument, 296 a 25-34. The motion attributed to the earth by certain philosophers (*viz.* the Pythagoreans, *supra* II 13, 293 b 15-32) will not be a natural movement, but an enforced (βία) movement, since the parts of the earth do not have such a movement, but actually move towards the centre (ἐπ' εὐθείας πάντα φέρεται πρὸς τὸ μέσον).

Sixth argument: Waters are (enclosed) in the hollows of the earth and in the oceans; it follows necessarily that the oceans and rivers [rather] belong to the †ethereal† body.

Cf. II 4, 287 b 5-7 ὑπόθεσιν λαμβάνουσιν ὅτι πέφυκεν αἰεὶ συρρεῖν τὸ ὕδωρ εἰς τὸ κοιλότερον· κοιλότερον δὲ ἐστὶ τὸ τοῦ κέντρου ἐγγύτερον.

Seventh argument: Whereas they [*sc.* the Pythagoreans] would extoll the nobility of fire, they debased it, and made the earth higher than it in the structure of the world.

Cf. II 13, 293 a 30 – b 1 Τῷ γὰρ τιμιωτάτῳ οἶονταί προσήκειν τὴν τιμιωτάτην ὑπάρχειν χώραν, εἶναι δὲ πῦρ μὲν γῆς τιμιώτερον, τὸ δὲ πέρασ τοῦ μεταξὺ, τὸ δ' ἔσχατον καὶ τὸ μέσον πέρασ· ὥστ' ἐκ τούτων ἀναλογιζόμενοι οὐκ οἶονταί ἐπὶ τοῦ μέσου τῆς σφαίρας κεῖσθαι αὐτὴν, ἀλλὰ μᾶλλον (293 b 1) τὸ πῦρ.

Eighth argument: If the earth were not in the centre, what should encompass it, since nothing but the heavy would fit it?

Ninth argument: From the earth and the other elements, the living beings are constituted, so it is necessary that the animalia belong to the ethereal body, and the ethereal body will be affected through its mixture with the bodies of the world of generation.

Tenth argument: If the earth were in motion, there would not be left anything stable in the world for the periphery to move around it.

Eleventh argument: The fact that [otherwise] the nature of the world would be reversed, so that the heavy would be above by nature, and the light would be below by nature.

Cf. II 14, 296 b 6-9 ἔτι δ' ἡ φορὰ τῶν μορίων καὶ ὅλης αὐτῆς ἡ κατὰ φύσιν ἐπὶ τὸ μέσον τοῦ παντός ἐστίν· διὰ τοῦτο γὰρ καὶ τυγχάνει κειμένη νῦν ἐπὶ τοῦ κέντρου.

[فأما أن الأرض ساكن في المركز، فيتبين بخمس عشرة حجج ...]

f. 1a

٣ والخامسة أن الأرض ترسب بطباعها،
فلو كانت كوكباً في الأثير لقد كانت تكون في مكان
خارج عن الطبع ❖

٦ والسادسة أن المياه في تقعيرات
الأرض والبحار، فوجب أن تكون البحار والأنهار
في الجسم الأثيري هـ

٩ والسابعة أنه من حيث زلّفوا شرف
النار، وضعوا عنها وجعلوا الأرض أعلى منها في
وضع العالم.

١٢ والثامنة إذا لم تكن الأرض في
المركز، فما ذا تحتوي عليه، ولا يوافقه إلاّ الثقيل.

١٥ والتاسعة أن من الأرض وباقي
الأسطقسات تتكوّن الحيوانات، فيجب أن تكون الحيوان
من الجسم الأثيري، وينفعل الجسم الأثيري بامتزاجه مع أجسام
عالم الكون.

f. 1b

١٨ والعاشر إذا كانت الأرض تتحرّك، فلا يبقى
بعد ثابت في العالم يتحرّك عليه المحيط.

٢١ والحادية عشر أن ينعكس طباع العالم فيكون
الثقيل فوق بالطبع والخفيف أسفل بالطبع.

Twelfth argument: 'Centre' is an homonymous word: Applied to the centre of a substance, it is the noblest part, like the heart relative to the animals and the ether relative to the world; the middle in a magnitude is the point of the centre, like the navel in the human body. But to say that the fire must be in the centre of the magnitude, while extolling its nobility, is pointless.

Thirteenth argument: Not the fire is the noblest body of the world [*pace* the Pythagoreans], but the ether.

Fourteenth argument: By saying that the noblest body in the world must be in the noblest place, they imply this to be the outermost place, but the centre and the middle in a substance are not in such a place.

Cf. again, II 13, 293 a 30 - b 1: Τῷ γὰρ τιμιωτάτῳ οἴονται προσήκειν τὴν τιμιωτάτην ὑπάρχειν χώραν, εἶναι δὲ πῦρ μὲν γῆς τιμιώτερον (...) ἄλλα μᾶλλον τὸ πῦρ.

Fifteenth argument: If the place of fire were the noblest of the places, then the ether would be in this place because it is the noblest of the bodies.

Cf. II 5, 288 a 4-12: ἡ πρὸς τὸν ἄνω τόπον (*sc.* φορά) τιμιωτέρα (θειότερος γὰρ τόπος ὁ ἄνω τοῦ κάτω) ... [I. 9] Εἰ γὰρ ἔχει ὡς ἐνδέχεται βέλτιστα (*sc.* ὁ οὐρανός), αὕτη ἂν εἴη αἰτία καὶ τοῦ εἰρημένου· βέλτιστον γὰρ κινεῖσθαι ἀπλῆν τε κίνησιν καὶ ἄπαυστον, καὶ ταύτην ἐπὶ τὸ τιμιώτερον.

As for a summary of the remaining arguments he [Aristotle] uses in refuting the (faulty) opinions concerning the earth being at rest, whether the reasoning is based [a] on the resemblance of the circumference to the surface of the sky and the horizon, or [b] its being above the water or above the air, we may dispense with it, because this has been given before at the beginning of the lecture in a summary of the core issues, a repetition being useless.

[a] Cf. II 13, 295 b 10-16: Οἱ μὲν οὖν πλεῖστοι περὶ τὰς αἰτίας ταύτας διατρίβουσιν· εἰσὶ δὲ τινες οἱ διὰ τὴν ὁμοιότητά φασιν αὐτὴν μένειν, ὥσπερ τῶν ἀρχαίων Ἀναξίμανδρος· μᾶλλον μὲν γὰρ οὐθὲν ἄνω ἢ κάτω ἢ εἰς τὰ πλάγια φέρεσθαι προσήκει τὸ ἐπὶ τοῦ μέσου ἰδρυμένον καὶ ὁμοίως πρὸς τὰ ἔσχατα ἔχον· ἅμα δ' ἀδύνατον εἰς τὸ ἐναντίον ποιεῖσθαι τὴν κίνησιν· ὥστ' ἐξ ἀνάγκης μένειν.

[b] Cf. II 13, 294 a 28 - b 2: Οἱ δ' ἐφ' ὕδατος κεῖσθαι. Τοῦτον γὰρ ἀρχαιότατον παρελήφραμεν τὸν λόγον, ὃν φασιν εἰπεῖν Θαλῆν τὸν Μιλήσιον, ὡς διὰ τὸ πλωτὴν εἶναι μένουσαν ὥσπερ ξύλον ἢ τι τοιοῦτον ἔτερον (καὶ γὰρ τούτων ἐπ' ἀέρος μὲν οὐθὲν πέφυκε μένειν, ἀλλ' ἐφ' ὕδατος), ὥσπερ οὐ τὸν αὐτὸν λόγον ὄντα περὶ τῆς γῆς καὶ τοῦ ὕδατος τοῦ ὀχοῦντος τὴν γῆν· οὐδὲ γὰρ τὸ ὕδωρ πέφυκε μένειν μετέωρον, ἀλλ' ἐπὶ τινός (294 b 1) ἔστιν. Ἔτι δ' ὥσπερ ἀῆρ ὕδατος κουφότερον, καὶ γῆς ὕδωρ· ὥστε πῶς οἶόν τε τὸ κουφότερον κατωτέρω κεῖσθαι τοῦ βαρυτέρου τὴν φύσιν;

Now the rule of sense perception is in the midst (*fī awṣāt*) of the explanations of the metaphysician in proofs demonstrating "why is the agent among the eternal things?": because He is the final end, since the things effected are beneath him, and through him their perfection is achieved, he being their end.

And the physicist (is concerned with) the final end (*ḡāya, causa finalis*) of things specific to them, either forms and actions, or the concomitants, and then the forms are their cause.

- والثانية عشر الوسط اسم مشترك يقع على
 ٢٤ وسط الجواهر، وهذا هو الأشرف فيه، كالقلب
 من الحيوان والأثير من العالم؛ والأوسط في العظم
 وهو نقطة الوسط كالسرّة في بدن الإنسان،
 ٢٧ فالقول بأنّ النار تجب أن تكون في وسط العظم
 مع تشريفهم لها لا وجه له .
 والثالثة عشر ليس النار أشرف أجسام
 ٣٠ العالم، لكنّ الأثير.
 والرابعة عشر ما قالوا إنّ أشرف
 f. 2a أجسام العالم يجب أن يكون بالمكان الأشرف، فهذا
 ٣٣ آخر الأماكن، والمركز والوسط في الجوهر لا يكون
 في مثل هذا المكان .
 والخامسة عشر لو كان مكان النار أشرف
 ٣٦ الأماكن، لكان الأثير فيه لأنّه أشرف الأجسام .
 فأما باقي استثمار الحجج التي ردّ بها
 الآراء في سكونها، إن كان كان علته تشابه المحيط أو وجه
 ٣٩ الخضراء أو العرض أو كونها على ماء أو على الهواء،
 فنحن نتسغني عنه لأنّها مضت في صدر التعليم
 المستثمرة، فإعادته لا تفيد .
 ٤٢ والقانون الحسيّ في أوساط بيانات الإلهي ببراهين لمّ الفاعل في الأزليّات، لأنّه
 الغاية، إذ كانت المفعولات دونه وبه كمالها فهو الغاية،
 f. 2b والطبيعيّ غايات الامور والخاصّة بها
 ٤٥ إمّا الصّور والأفعال وإمّا اللوازم، فالصور اذن
 كانت بسببها هـ

٣٠ الأثير [الأثيرى، خ، وحرف الياء النهائي مشطوب

٣٢ الأشرف] الوسط، خ

٣٤ هذا [غايات Langermann

The main issues (*maṭālib*) of this lecture (*ta'lim*) are four:

The FIRST is the place of the earth.

The metaphysician says: (It is in) the centre, because this evolves necessarily from the Fifth Nature due to its being at rest; and movement precedes rest, and what comes to be from it comes to be at first, and from rest, at last; and because it (the earth) is close (*yuḡāwir*) to what is not corrupted.

The physicist says: Because it is heavy and cold.

The SECOND is its movement.

The metaphysician says: It is immobile because it is a totality following its totality in the final end, that is to say, the spherical body.

Cf. II 14, 296 b 6-15: Ἔτι δ' ἡ φορὰ τῶν μορίων καὶ ὅλης αὐτῆς ἢ κατὰ φύσιν ἐπὶ τὸ μέσον τοῦ παντός ἐστίν· διὰ τοῦτο γὰρ καὶ τυγχάνει κειμένη νῦν ἐπὶ τοῦ κέντρου· [...] ἀνάγκη δὲ πρὸς τὸ τοῦ παντός· καὶ γὰρ τὰ κοῦφα καὶ τὸ πῦρ εἰς τὸναντίον φερόμενα τοῖς βάρεσι πρὸς τὸ ἔσχατον φέρεται τοῦ περιέχοντος τόπου τὸ μέσον.

The physicist says: Because it is in the place natural to it. If it moved in a straight line, it would either go on infinitely, and go beyond the world – or come to rest while being above it in some place, and still belonging to it. If, by analogy to this, we were to instance a stone, it would not need to be thrown, neither rotating nor rolling nor in a spiral motion, because the sphere needs to be at rest, according to what the metaphysician says.

The physicist: Because this necessitates that inside it there is something around which it should rotate, so it would come part (*yatabaddad*) and be disrupted; and (as a further consequence), the stone (thrown upwards) would not meet the place (on the ground) corresponding to its azimuthal position (when descending).

Cf. II 14, 296 b 21-25: Φανερόν τοίνυν ὅτι ἀνάγκη ἐπὶ τοῦ μέσου εἶναι τὴν γῆν καὶ ἀκίνητον, διὰ τε τὰς εἰρημένας αἰτίας, καὶ διότι τὰ βία ῥιπτούμενα ἄνω βάρη κατὰ στάθμην πάλιν φέρεται εἰς ταυτό, ἂν εἰς ἄπειρον ἢ δύναμις ἐκριπτῆ.

II 8, 290 a 9-10: τοῦ δὲ σφαιροειδοῦς δύο κινήσεις εἰσὶ καθ' αὐτό, κύλισις καὶ δίνησις, εἴπερ οὖν κινεῖται τὰ ἄστρα δι' αὐτῶν.¹

[The THIRD IS] its being at rest.

The Metaphysician says: By nature, because it is following a principle in its final end, and because it is a totality.

The Physicist says: Because it is in the last of places, and where it is adjacent to the indestructable.

Opinions were divided about this. Some people said: (the earth is at rest) because of its resemblance to the circumference. Some said: because it is (floating) on the water; and some people said: because it is upon the air.

¹ “Among the arguments which Ibn al-Ṭayyib gives against the theory of the rotation of the earth is the assertion that such a motion would produce centrifugal forces that would cause the earth to break up (*yatafakkaka*). It is interesting to note that Copernicus attributes this same argument to Ptolemy, but no such statement is found in the *Almagest*. With the exception of one remark by Koyré, I have not found any discussion of this point” (Langermann, *loc. cit.* [supra, p. 265], p. 253). Langermann refers to Ptolemaeus, *De Revolutionibus* I 7, and A. Koyré, *The Astronomical Revolution*, trans. R.E.W. Maddison, Hermann - Methuen - Cornell U.P., Paris - London - Ithaca N.Y. 1973, p. 112 (n. 9 to p. 57); cf. also J.L.E. Dreyer, *A History of Astronomy from Thales to Kepler*, Dover, New York 1953², pp. 271-2.

ومطالب هذا العلم أربعة :

الأول في مكان الأرض .

٤٨ والإلهي يقول : الوسط لأنها واجبة عن الطباع الخامس لأجل سكونه، والحركة تتقدّم السكون

فما يكون عنها يكون أولاً وعن السكون أخيراً ولأنها تجاور ما لا يفسد هـ

٥١ والطبيعي

يقول : لأنها ثقيلة وباردة هـ

والثاني في حركتها .

٥٤ والإلهي يقول : غير متحركة لأنها كليّة وتابعة لكليته

في الغاية وهي الجرم الفلكي .

والطبيعي :

٥٧ لأنها في المكان الطبيعي لها، وإن تحركت على

الاستقامة، فإما أن تمضي بلا نهاية فتفوت العالم

أو تقف [فإنه] فوقها في أحد الأماكن وهي منه . وعلى

٦٠ هذا لو طرحنا حجراً لما وجب أن يلقي ولا على الاستدارة

لا رحاوية ولا دولاوية لأنه يلزم أن يكون الفلك

ساكناً على ما يقول الإلهي .

٦٣ والطبيعي : لأن هذا يوجب

أن يكون داخلها شيء متحرك عليه وأبداً ويتفكك

ولا يلقي الحجر الموضع الذي يسامت به .

٦٦ و«الثالث في» سكونها * والإلهي يقول : بالطبع لأنها

تابعة لمبدأ في غابته ولأنها كلية .

والطبيعي : لأنها في آخر الأماكن وبِحَيْث يجاور ما لا يفسد هـ

٦٩ واختلف الناس فيه فقوم قالوا : لتشابهها

من المحيط * وقوم قالوا

لأنها على الماء * وقوم قالوا لأنها على الهواء *

٧٢ وقد أفسدنا هذه الآراء كلها .

f. 3a

٦٤ وأبداً [تأبّد leg.

٧٢ وقد افسدنا هذه الآراء كلها [add. in margine

We have refuted all these opinions.

Cf. II 13, 295 b 10-16 εἰσὶ δὲ τινες οἱ διὰ τὴν ὁμοιότητά φασι αὐτὴν μένειν, ὥσπερ τῶν ἀρχαίων Ἀναξίμανδρος, etc. [v. *supra*].

Cf. II 13, 294 a 28 - b 6 Οἱ δ' ἐφ' ὕδατος κεῖσθαι, etc. [v. *supra*].

The FOURTH is its being finite, and that its shape is spherical.

<The Metaphysician says:> Because it is following a principle in its final end and in its essence, and so its concomitants, and whatever is of this description, i.e. in its end, is finite. And (further) because it is eternal: the eternal is deprived of principles and ends, and so are its concomitants, among them its shape.²

The Physicist says: Because the form of the dimensions is encompassing the matter. And from the sense-perception (it is clear), since when going a some distance, you will see part of the southern stars you did not see before.

Cf. II 14, 297 b 30-34: Ἔτι δὲ διὰ τῆς τῶν ἀστρῶν φαντασίας οὐ μόνον φανερόν ὅτι περιφερῆς, ἀλλὰ καὶ τὸ μέγεθος οὐκ οὔσα μεγάλη· μικρᾶς γὰρ γιγνομένης μεταστάσεως ἡμῖν πρὸς μεσημβρίαν καὶ ἄρκτον ἐπιδήλως ἕτερος γίγνεται ὁ ὀρίζων κύκλος.

And further, because the earth is convex, and convexity goes with the spherical (form).

Cf. II 14, 297 b 23-30: Ἔτι δὲ καὶ διὰ τῶν φαινομένων κατὰ τὴν αἴσθησιν· οὔτε γὰρ ἂν αἰ τῆς σελήνης ἐκλείψεις τοιαύτας ἂν εἶχον τὰς ἀποτομάς· [...] περὶ δὲ τὰς ἐκλείψεις αἰεὶ κυρτὴν ἔχει τὴν ὀρίζουσαν γραμμὴν, ὥστ' ἐπεὶ περ ἐκλείπει διὰ τὴν τῆς γῆς ἐπιπρόσθησιν, ἢ τῆς γῆς ἂν εἴη περιφέρεια τοῦ σχήματος αἰτία σφαιροειδῆς οὔσα.

End of the lecture, and of the second treatise, as commented upon by the master, the excellent philosopher, Abū l-Faraġ 'Abdallāh ibn al-Ṭayyib, may God be pleased with him, in the method of presenting the gist in concise exposition.

To the giver of reason be praise without end
God bless the lord of the prophets, Muḥammad, and his chaste family
He is sufficient for us and the best trustee.

² leg. *ṣaklūhā*, sc. *ṣakl al-ard*?

f. 3b

- والرابع في أنّها متناهية وشكلها كري .
 <والإلهي يقول: > لأنها تابعة لمبدأ في غايته في ذاته ولوازمه ،
 ٧٥ وما هو بهذه الصفة، أعني في غايته، هو متناهٍ ،
 ولأنها أزليّة تعدم المبادئ والغايات ،
 وهكذا لوازمه ومن جملتها شكله ❖
 والطبيعي يقول : لأنّ صورة الأبعاد محتوية على المادّة ،
 ٧٨ ومن الحسّ من قبل أنّك لو سرت يسيراً لرأيت من الكواكب
 الجنوبيّة ما لم يكن تراه . ولأنّ الأرض محدّبة والتحديد
 مع الكريّة . ٨١
 وينقضي التعليم والمقالة الثانية
 من كتاب السماء تفسير الشيخ الفيلسوف الفاضل
 ٨٤ أبي الفرج عبد الله بن الطيّب رضي الله عنه على طريق
 الثمرة والاختصار هـ
 ولواهب العقل حمداً بلا نهاية
 ٨٧ وصلّى الله على سيّد رسله محمد وآله الطاهرين
 وهو حسبنا ونعم الوكيل