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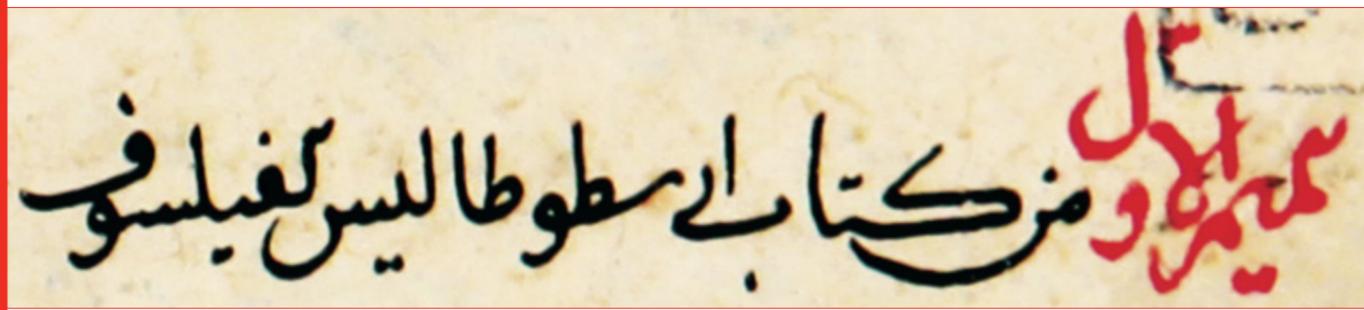
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Mašhad, Kitābḫāna-i Āsitān-i Quds-i Raḍawī 300, f. 1v
Paris, Bibliothèque Nationale de France, grec 1853, f. 186v

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Pragmatic Markers from Greek into Arabic

A Case Study on Translations by Isḥāq ibn Ḥunayn

Kerstin Eksell[*]

Abstract

Classical Greek is known for its abundant use of particles and connectives for organising the textual discourse. In Arabic, on the other hand, such markers are much less frequent, which causes problems in translating from Greek into Arabic. The aim of this study is to examine the transfer of Greek particles into Classical Arabic texts. The material consists of short text samples from the *Physics* by Aristotle and the *Elements* by Euclid, both of which were translated by the well-established translator Isḥāq ibn Ḥunayn. The translator seems to have followed a consistent regime of strategies, with the general aim to translate as closely and accurately as possible, while avoiding direct borrowing from Greek. The *taxis* of the source text was used as a model for the target text, which is characterised by its syntactic iconicity in relation to the source text. It is suggested that a special generic style became established for expressing a scholarly identity of mixed Greek and Arabic origin, different from other stylistic developments of literature within the Arabo-Islamic space.

The Problem

A salient characteristic of Classical Greek is its abundant use of particles and connectives for organising the textual discourse. Most other languages have more restricted lexical resources in this respect. Consequently, a variety of strategies is needed for adequate translations of Greek discourse into other languages, and contrastive analyses of the phenomenon are motivated.

The aim of this study is to examine the transfer of Greek particles into Classical Arabic texts in a selected material from different aspects, both linguistic and socio-cultural. The findings will contribute to the understanding of the practical influence of the Greek scientific texts, a well as of the role played by the Arabic translator in the formation of the scholarly Arabic discourse.

The problem will be viewed against the background of research on pragmatic markers in a general perspective.

I. Pragmatic Markers: An Overview

In the perspective of universal grammar, Greek particles obviously belong to the field of discourse or pragmatic markers, which has been a rapidly expanding field of investigation since around 1970.

The relation between Greek particles in particular and discourse markers globally is an obvious one. As Karin Aijmer and Anne-Marie Simon-Vandenbergen[1] point out, John Dewar Denniston's

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[1] K. Aijmer - A.-M. Simon-Vandenbergen, "Pragmatic Markers", in J.-O. Östman - J. Verschueren (eds.), *Handbook of Pragmatics 2009 installment*, in collaboration with E. Versluys, J.B. Publishing Co., Amsterdam 2009 (Handbook of Pragmatics, 13) and online 2012, pp. 1-29, esp. p. 2.

The Greek Particles[2] from 1934 is a pioneer work in the study of pragmatic markers in general, a forerunner, which is still an authority on the subject.

The theoretical and methodological areas have grown increasingly complex over time, as has the number of separate studies. The markers may be defined in several ways depending on occurrence, function, etymology etc. In this context, it will suffice to make a general survey of the most basic and recognized entities within the spectrum.

Already the variety of terms used to denote the spectrum is considerable and reflects the various angles of perspective. The older term 'particle' refers to most of the most common specimina being difficult to define with regard to word class. The term 'marker' signals that the specimina fulfil some kind of function in their textual setting. Discourse marker emphasizes that the particles in question operate within the process of speech (spoken or written), whereas 'pragmatic marker' is often used in a wider sense, including both purely discourse influencing markers as well as any marker organising the text. The latter term, in its umbrella function, has been chosen in this study so as not to exclude possibly interesting markers, but there are fluctuating limits between the two, and few substantial criteria to distinguish one instead of the other.

The basic definition of a pragmatic marker is that it is a syntagm that a) helps organising the speech process, and b) does not affect the propositional content of the utterance. Its function is to indicate the relation of the parts of speech to another or to the actors involved. In particular, it operates with a view to guiding the listener/reader in his interpretation of the message communicated. It is a combination of text organising and speaker/listener oriented functions. The pragmatic marker may be called 'deictic' and meta-lingual, and it creates cohesion in the text. Usually, it organises the speech above the sentence level and thus belongs to macrosyntax. It is usually sentence-initial. It is often difficult to define it with regard to syntactic property and it has little meaning lexically. It tends to be multifunctional, but on the other hand it may have quite specific functions.

With regard to lexical and syntactic properties, those examples represent a variety of categories. Aijmers and Simon-Vandenbergen[3] list the following: connectives, modal particles, interjections, routines ("how are you"), feedback signals, vocatives, disjuncts ("frankly, fortunately"), pragmatic use of conjunctions, approximators (hedges), reformulation markers.

Note that cohesion, text organisation and listening guidance may be achieved by other syntactic and stylistic devices, apart from prosody in oral discourse, typically by word order, emphasis, repetition, paralleling and contrasting etc.

Greek Particles into Arabic – State of the Art

The difficulties of rendering the Greek particles into Arabic have long been recognised, and their correspondence in Arabic translations has been commented upon by a few researchers.

Strangely, no one of those has connected the particles with the global phenomenon of discourse particles; no one tries to view the particles as related to a global linguistic phenomenon, perhaps because this field of study has only developed within the last few decades. Nevertheless, some important observations have been made in the case of Arabic.

Hans Daiber[4] emphasises the tendency of the Arabic translators to leave the Greek particles out of the translation: These particles which modify sentences or sentence parts "gedanklich", and give

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[2] J.D. Denniston, *The Greek Particles*, Clarendon Press, Oxford 1934 (1954²).

[3] Aijmer - Simon-Vandenbergen, "Pragmatic Markers" (online ed. 2012), p. 10.

[4] H. Daiber, *Aetius Arabus. Die Vorsokratiker in arabischer Überlieferung*, Steiner, Wiesbaden 1980 (Veröffentlichungen der Orientalischen Kommission, 33), p. 36f.

the Greek language "ein besonders lebendiges Gepräge" may "vielfach vernachlässigt werden". A variety of examples of omittance are given. There are understandable reasons for these omittances, according to Daiber: the particles may have seemed pleonastic, or their effect, generally emphatic or more specific, may emerge from the context alone. Also, the Arabic language is poor with regard to particles in comparison with Greek. Finally, Daiber quotes Denniston, who notes that Greek particles quite often cannot be translated into a modern language [either], but must be marked by "inflections of the voice in speaking or by italics (…)".

Discussing Byzantine language varieties, which ought to have influenced the Arabic translators, Daiber furthermore explains that in these linguistic stage, particles were not as frequent as in classical Greek, and when they do occur, they may be pleonastic more often then in classical Greek.[5]

To this analysis may be added the lexical enumeration by Gerhard Endress in his *Die arabischen Übersetzungen von Aristoteles' Schrift De Caelo*.[6] Here,[7] the author makes an extensive list of Arabic particles and adverbs, which may be characterised as stylistic or rhetoric means, thus corresponding to many of the Greek particles. Contrary to the enumeration by Daiber, we are presented with many examples of how Greek particles are in fact translated. Endress does not, however, characterise the treatment of the particles in general.

Hans-Jochen Ruland[8] presents a similar enumeration, although shorter.

A welcome completion of the type of careful lexical correspondences is undertaken by Dimitri Gutas in his edition of Theophrast's *On First Principles*.[9] Here, Gutas provides a very extensive Greek-Arabic glossary, in which every Arabic rendering of every Greek particle and adverb is listed, included the cases in which the translation is simply omitted, or the meaning is expressed by the syntactic context. Although no survey is provided, the reader is given access to the material and is able to get a clear and differentiated picture of the treatment of the particles. Also very valuable is the Greek-Arabic dictionary *GALex* in the process of being published by Endress and Gutas, in which a similar system has been applied.

Already the plentiful material provided by Gutas and Endress suggests that the Greek particles are in fact quite often translated, or at least somehow taken into account in the translation. This is also borne out by the investigation by Uwe Vagelpohl,[10] which is the single most extensive study on the subject so far. Vagelpohl, aware of the importance of the particles in Greek, devotes one part of his study to the rendering of four selected particles: the connectives μέν, δέ, and γάρ, and the phoric adverb οὖν as appearing in a text derived from the *Rhetorics*. Vagelpohl is able to show convincingly that those particles are usually translated, but according to a differentiated scale. From the results it

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[5] On late Greek particles *et. sim.* cf. *ibid.*, pp. 39-62, esp. p. 52f. (plenty of notes to p. 36f.: notes 233-261, p. 300f. Extensive use of *mubtadaʾ* + *ḫabar* word order: p. 7.

[6] G. Endress, *Die arabischen Übersetzungen von Aristoteles' Schrift De Caelo*, Diss. Frankfurt am M. 1966, p.37f. generally on particles; pp. 63-72 particles and other cohesion devices treated as stylistics ("Phraseologie"); syntax pp. 73-86 ("Übersetzungstechnik"), obs. "Konjunktionen", p. 85f.

[7] *Ibid.*, pp. 63; esp. p. 85.

[8] H.-J. Ruland, *Die arabische Übersetzung der Schrift des Alexander von Aphrodisias über die Sinneswahrnehmung*, Vandenhoeck & Ruprecht in Göttingen, Göttingen 1978: cf. coordinated conjunctions p. 200; adverbs p. 198f.; interrogative and demonstrative pronouns p. 197f.; particles p. 200.

[9] D. Gutas, *Theophrastus 'On First principles' (Known as His 'Metaphysics': Greek Text and Medieval Arabic Translation as well as the Medieval Latin Text, with Introduction, Commentaries and Glossaries*, Brill, Leiden - Boston 2010 (Philosophia Antiqua, 119).

[10] U. Vagelpohl, *Aristotle's Rhetoric in the East. The Syriac and Arabic Translation and Commentary Tradition*, Brill, Leiden - Boston 2008 (Islamic Philosophy, Theology and Science. Texts and Studies, 76).

may furthermore be possible to deduce that a particle carrying a heavy load of significance is usually translated (here γάρ), whereas a particle with a vague load of significance, such as οὖν, is likely to be omitted in the translation.

This short survey explains why further study of the transfer of Greek particles into Arabic, is called for. We need to map out the occurrences in more detail, look for systemic lines, and adapt the study to the on-going study on this type of phenomena on the global level.

Description Model adapted for the purpose

Out of several possible classification models, the investigation in this study follows the primary distinction suggested by Michael Halliday[11] and especially by Laurel J. Brinton.[12] They divide pragmatic markers into two main groups: a) textual markers and b) interpersonal markers. Textual or continuative markers, to speak with Halliday[13] "signal a move in the discourse: a response, in dialogue, or a new move to the next point if the same speaker is continuing" (examples: yes, well, now). Thus, the textual markers typically signal discourse boundaries or topic shifts. Interpersonal markers, on the other hand, express the attitude of the speaker/writer; they function as subjective comments, thereby emphasising the speaker's own view of perspective on the communication delivered for the listener (examples: certainly, frankly). Obviously, both types of markers may belong to different word classes or syntactic categories. For the purpose of this study, I have tentatively chosen the following rough classification grid:

Textual – continuative categories:

A. Modal particles – phoric adverbs
Examples in English: now, then, here, there

This type of expressions may be considered the core of pragmatic markers. They fulfil all criteria for the group and were earlier often left out of the textual analyses as being mere fillers. In Greek, this type occurs abundantly.

B. Modal particles - argumentative adverbs
Examples in English: thus, therefore, also, moreover, already, still, yet

Those adverbs modify one or more syntagms, relating the concept modified to the others in the proposition, without radically changing the main content of the proposition, and may thus be included among pragmatic markers. However, they tend to be more monofunctional in comparison with phoric adverbs, with a recurrent lexical meaning.

The types A and B stand out as a typical characteristic of any Greek classical text, usually called simply "particles", and described and analysed in depth by Denniston.[14]

C. Connectives
Examples in English: so, because, since, and, but, or

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[11] M.A.K. Halliday - Ch. Mathiessen, *An Introduction to Functional Grammar*, Arnold/Oxford U.P., New York - London 2004³, Routledge, 2014⁴.

[12] L.J. Brinton, *Pragmatic Markers in English*, De Gruyter, Berlin 1996 (Topics in English Linguistics [TiEL], 19).

[13] Halliday - Mathiessen, *An Introduction to Functional Grammar*, p. 81.

[14] Cf. Denniston, *The Greek Particles*.

Connectives are not always considered to be pragmatic markers, and their classification as such is at least partly dependent on the contextual discourse situation. In contrast to phoric adverbs, they tend to have quite a definite syntactic function, organising the relation between sentences in a specific way. However, they have certain properties in common with pragmatic markers: They are outside the propositional content of the single sentence, they do not relate clearly to any etymological word class, and they are used to organise the text for the benefit of the listener/reader. In Greek, they are usually mentioned along with phoric particles.

D. Word order

To emphasize a concept in the sentence by topicalising, or by marking its syntactic position in other ways, is a pragmatic function, where the order itself is the marker. It should be mentioned here because it has significant bearing on parts of the translation process from Greek into Arabic, as will be apparent below.

Interpersonal

E. Comment clauses, modal comment adverbs
Examples in English: you know, I mean, frankly, necessarily

Those expressions obviously represent the speaker's attitude. He uses them to break his own discourse, making the discourse livelier and more engaging to the listener. The expressions certainly have a pragmatic and meta-lingual function, even if they are easily defined linguistically as isolated syntagms.

Register and Genre

The core types of pragmatic markers are usually considered a property of informal or even vulgar speech. Words such as 'well', 'like', 'you know', typically abound in natural discourse. New modal particles seem to originate here, possibly to become grammaticalised over a period of time. The increase of recorded material over the last decades have made it possible to study the appearance of pragmatic markers in natural discourse, thereby revealing a number of functional pragmatic characteristics.

However, information to the contrary is also evident. Cleveland Kepler states that cohesion is typically more often overtly signalled in written than in oral discourse.[15] The distance between the writer and the reader calls for more guidance on part of the writer. The writer must be explicit in showing the organisation of his text by means of written markers, since he cannot rely on prosody, body language, and other interactivity with the listener as in oral discourse. The humming and hesitancy will certainly disappear in writing, as will spontaneous utterances from the vulgar register. On the other hand, other markers organising the text, for example connectives organising the sentences hierarchically, or argumentative markers distributing emphasis between single syntagms of the sentence, may be very helpful to the writer, giving increased transparency to the propositions of the text.

Pragmatic markers may be of special importance in any written text which is argumentative. Didactic texts, for example, will benefit from markers that signal not only the proposition as such, but which emphasise the order of the propositions and highlight single components of an argument. Not

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[15] An article with extensive lists of "extensive markers", a term used in a somewhat wider sense than "pragmatic markers" here. See www.extensionmarkers.blogspot. dk (=Kepler 2010).

only textual markers but interpersonal ones interspersed in the text will underline the argumentative emphasis. By borrowing a characteristic of the oral discourse ("you know"; "I think"...), the writer will bring about an effect of direct communication with the reader and strengthen his persuasive force. Consider for example the following passage of a didactic text by Bertrand Russell (1912, reprinted in 1998):

> **Thus** (phoric adverb) it is our particular thoughts and feelings that have primitive certainty. **And** (emphatic connective) this applies to dreams and hallucinations as well as to normal perceptions: when we dream or see a ghost, we **certainly** (argumentative adverb) do have the sensations we think we have, but for various reasons it is held that no physical object corresponds to these sensations. **Thus** (phoric adverb) the certainty of our knowledge of our own experiences does not have to be limited in any way to allow for exceptional cases. Here, **therefore** (phoric adverb), we have, **for what it is worth** (interpersonal comment), a solid basis from which to begin our pursuit of knowledge.[16]

The Importance of Pragmatic Markers for Graeco-Arabic studies

The propositional content of a text may be its kernel or main message. However, the number of pragmatic markers of all kinds is surprisingly high. The propositions of any text will be presented wrapped up in, or spiced with, a number of additional pragmatic words, particles, or whole phrases, which somehow serve to bring out the meaning of the text, making it clearer, better defined, nuanced and modified etc. Since the use of pragmatic markers tends to be optional and subjective, dependent on the aims of communication on behalf of the speaker/ writer, the study of their occurrence and distribution will obviously be of great importance for understanding a text in all its aspects.

In contrastive and translation studies, the use of pragmatic markers offers a wide field of investigation. Although pragmatic markers occur in most languages, correspondence between particles in different languages is only partial. There are common properties and partly overlapping semantic and syntactic areas, but there are also variations and grey zones, which may relate to the linguistic structures of each language, but which is also dependent on the multifunctionality of pragmatic markers in general.

Contrastive comparison between languages is a self-evident part of translational studies and necessary for any practical translation work. Translators deal with pragmatic markers in an ad hoc way, as indeed they must. Any translation will show that some markers are simply not translated at all, while others may reappear as some sort of compensation in the word structure, and some, finally, more or less directly translated. The context will be a governing factor for choice of translation strategy even in languages akin in structure and culture, as for example English and Swedish. With regard to Greek, its extensive use of pragmatic particles is idiomatic and it is usually not fully mirrored in any translation. Omitting pragmatic particles is actually an ordinary strategy in any translation; it does not mean that the translation is somehow deficient (contrary to a common misunderstanding among laymen not familiar with translation).

In addition to the investigation of formal text linguistic properties, register and genre will be important for the choice of translational strategy. Since the use of pragmatic particles tends to be more optional than the propositional kernel of the speech, the translator may choose to vary those particles according to which specific effects he wants to emphasise in a given context in terms of

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[16] B. Russell, *Problems of Philosophy*, Oxford U.P., Oxford 1959 (Galaxy book, 21), repr. 1971-1972. Ed. in hypertext by Andrew Chrucky 1998 [URL: < www.ditext.com/russell/russell.html >], Ch. II, p. 16.

register or genre. In view of the wide spectrum of options, the devices chosen by the translator will yield a lot of information about the translated text and its context on different levels.

The present study will take special notice of the Arabic translator's attitude towards his work: What are his intentions with the translation? What are his global translation strategies? Is he mainly interested in transferring the propositional content? How literal does he want his translation to be? How close does he want to be to the source and its author?

Related to these questions are those concerning the attitude of the receiving culture in general.

What are the intentions behind the transfer of material from Greek culture? Is it consciously adapted to the target culture? Any translation will by definition show some kind of loyalty towards its source. How far does it go and which other influences are at play?

If it is the basic presumption here that Graeco-Arabic transfer usually involves factors of cross-pollination and inculturation, in which way may this study throw light on the process?

II. The Case Study
The Material

The material used for a close reading analysis consists of a) a text from the *Physics* by Aristotle,[17] and b) two texts from the *Elements* by Euclid, *Book* I, proposition 1, and *Book* VI, proposition 1.[18]

General Characteristics of each Text

The Aristotle text

In this part of the *Physics*, Aristotle is concerned with the nature of time. It is a subject which he himself finds difficult. He ponders upon it, tries different angles, points out the illusive and partly contradictory nature of time and of the past, the present and the future as properties thereof, and discusses how to define time in an objective way. The style reflects his argumentative and lively reasoning. It is subjective and didactic:

> Since (connective), then (phoric adverb), we are not aware of time when (connective) we do not distinguish any change (…), whereas if (connective) we perceive and distinguish changes, then (phoric adverb) we say that time has elapsed, it is clear (interpersonal comment) that time cannot be disconnected from motion and change. – Plainly (interpersonal comment), then (phoric adverb), time is neither (connective) identical with movement nor (connective) capable of being separated from it (*Phys.* IV 11, 281 b 11ff).

Aristotle wants to get the attention of the reader, directing it among the many logical windings of the discourse. Pragmatic markers are indeed called for to help in guiding the reader. Sometimes the discourse is difficult to follow, with a complicated syntax. The translator simplifies but is on the

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[17] Aristotle, *The Physics, Books I-IV*, P.H. Wicksteed - F.M. Cornford, Harvard U.P. - Heinemann, Cambridge Mass. - London 1957 revised edition (Loeb Classical Library, 228), pp. 372-84.

[18] This case study has included an analysis of the Theophrastus text edited by Dimitri Gutas (cf. *Theophrastus 'On First principles'*, IV, pp. 14-15; Greek section pp. 128-35), including ca. 30 examples. Gutas attributes the Arabic translation to Isḥāq ibn Ḥunayn, the Theophrastus text is, as Gutas calls it in his *Introduction*, "convoluted" and has obviously caused the Arabic translator great problems. Paraphrases, omissions and perhaps misunderstandings abound, and a direct comparison is complicated. On the other hand, the edited Greek and Arabic texts with the careful commentary and word list supplied by Gutas are a valuable complement to the present study, serving to corroborate and verify the findings.

whole surprisingly close to the original. A few misunderstandings do not blur this general picture: here, of course, we are dependent on the edition by Badawī and unable to say whether deviations from the source as known to us depend on alternative text versions or on mistakes in the edition. It has often been noted though that Aristotle's texts, as they have been preserved, are often rather intricate and unclear, consisting primarily of pragmatic teaching material.

The Euclid text

The first Greek text translated, Proposition I from *Book* I, deals with how to construct a triangle of equal sides on a straight line by letting the latter form the *ratio* of a circle. The second text, Proposition 1 from *Book* VI, demonstrates how triangles and parallelograms of the same height have the same proportion to each other as the proportion between their bases. Both texts are written in a very clear and concise style. Every sentence contains a factual proposition, and the statements are all ordered in an argumentative chain, relating each proposition to the next. All propositions are logically explained, but no elaborations are used. In spite of their economy, these texts, too, are obviously didactic and make extensive use of pragmatic markers:

> In fact (argumentative adverb), since (connective) it was shown that as (connective) base BC (is) to CD, so (connective) triangle ABC (is) to triangle ACD, and as (connective) triangle ABC (is) to triangle ACD, so (connective) parallelogram EC (is) to parallelogram CF, thus (phoric adverb), also (argumentative adverb), as (connective) base BC (is) to base CD, so (connective) parallelogram EC (is) also (argumentative adverb) to parallelogram FC (*Elements*, VI, 1).

The *Elements*, in different languages, is one of the world's most extensively used handbooks in teaching, from antiquity unto the last century. Part of its popularity is probably due to its pedagogical preciseness and lucidity.

Method and limitations

The analysis is purely qualitative. Since the markers in question occur with a high density in any Greek text, the focus of the investigation has been on qualitative evaluation of the markers within their macro-syntactic context, and no attempt has been made to add a quantitative estimation to the results thus achieved.

The material is somewhat arbitrarily chosen, yet, I believe it shares such sufficient similarities and variables as could reasonably be expected for an article of this scope. The two texts have some characteristics in common, mainly that they are scientific texts on secular learning – philosophy and mathematics – and that stylistically they may be expected to be generically didactic.

Two different authors have been at work. Euclid is considerably later than Aristotle, but on the other hand, the source as transmitted to us, and already to the Arabs, has always been central in the mathematical curriculum and may have become normalised in the course of pedagogical appropriation.

A significant common denominator for both texts is their attribution to the translator Isḥāq ibn Ḥunayn. For the *Elements*, the text given in Nayrīzī's commentary has been used too. It is traditionally supposed to reflect the translation of the *Elements* by al-Ḥaǧǧāǧ.[19]

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[19] See more below, note 20.

Isḥāq ibn Ḥunayn is a well-known and professional translator. He is a representative of the translating tradition which had already developed standard strategies and had great experience, and being familiar with the particular difficulties of translating: the need for balancing between conveying the message and expressing it in an understandable form.

In this study, it is not assumed that Isḥāq ibn Ḥunayn has an individual way of expressing pragmatic markers, differing from other Arabic translators; rather on the contrary, the findings, as far as can be ascertained at this stage, are believed to be consistent in a general sense with material produced by other translators. An illustration of this may be seen already in this analysis when the parallel text of the *Elements* by Nayrīzī is compared. However, a short comparative survey has been added after the textual analysis.

The scientific status of the Arabic studied texts is somewhat uncertain. The text from Euclid by Isḥāq ibn Ḥunayn is in fact not edited at all, but is presented here as an ad hoc version from a couple of selected manuscripts.[20] The main source has been the well-known manuscript MS Madrid Escorial Derenbourg 907, which is part of the tradition of manuscripts ascribed to the translation of Isḥāq ibn Ḥunayn.[21] This text has been compared with the parallel paragraphs in MS Uppsala O. Vet. 20.[22] The actual sections show only few and marginal variants without relevance to the present discussion.[23]

In addition, I have compared the corresponding texts as presented in the Heiberg edition of Nayrīzī's commentary, usually considered as deriving from the translation by al-Ḥaǧǧāǧ[24] (although this attribution is not unambiguous). Generally, the Nayrīzī text, although often similar or even identical to that of the manuscripts of the Isḥāq ibn Ḥunayn tradition, also shows some obvious variants, some of them in regard to the choice of pragmatic markers.[25] Consequently, it is probable that the text material

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[20] The Arabic transfer of the *Elements* was a highly complex and intriguing process, all the turnings of which are still surprisingly little known. The main authority on this problem, Sonja Brentjes, has written a series of articles, which outline the problem and brings the state of research as far as seems possible for the moment. For a recent survey of the difficulties facing the researcher and of the enquiries made so far, see also S. Brentjes, "Observations on Hermann of Carinthia's version of the *Elements* and its relation to the Arabic transmission", *Science in Context* 14/1-2 (2001), pp. 39-84; Ead., "Problems with the Arabic translation of Euclid' s *Elements*", paper delivered at the Workshop "From Alexandria to Toledo" (May 12th, Copenhagen 2011), in press [www. greekarabictransfer.com/workingpapers]. Here, a very brief summary will have to suffice. According to Arabic sources (the *Fihrist*), the first translation was made by al-Ḥaǧǧāǧ around 800 Later, al-Ḥaǧǧāǧ made a second translation, or a revision of the first one. None of these texts survive in complete copies: however, there are manuscripts which seem to continue a Ḥaǧǧāǧ tradition, at least partly preserving phrasings and terminology which have been identified as typical of al-Ḥaǧǧāǧ. Later during the 9th cent., a new translation of the *Elements* was undertaken by Isḥāq ibn Ḥunayn, with the help of Ṯābit ibn Qurrā (also according to the *Fihrist*). The relation between the two translations, as well as the extent of the contribution by Ṯābit ibn Qurrā, remains uncertain. However, the translation by Isḥāq ibn Ḥunayn served as the basis for most of the (hundreds of) manuscripts produced later. Quite often, the preserved manuscripts appear to be somehow mixed, dominantly following Isḥāq ibn Ḥunayn's version but with some passages flavoured by al-Ḥaǧǧāǧ also featuring. Due to the intricate state of the existent manuscripts, no complete edition exists of the *Elements*. However, since the manuscripts recorded have been carefully catalogued and classified, it is possible to use them, although with cautiousness, for specific and limited purposes, for example for this study.

[21] Received by courtesy of the Escorial Library. It belongs to the A family of manuscripts, the Andalusian section, from the 13th century. It is well written in large Magrebin letters.

[22] MS Uppsala O. Vet. 20, f. 3, f. 58v. This manuscript belongs to the B family, also the Isḥāq ibn Ḥunayn tradition, and is believed to be much earlier, probably from 1042-1043.

[23] The Escorial manuscript is generally the more elaborate than the Uppsala one.

[24] 13th century. No complete evaluation of the Nayrīzī text has been undertaken, but it has been noted that it does show Ḥaǧǧāǧian characteristics.

[25] Both texts are remarkably faithful to the Greek original, as we know today, so there is hardly any reason to believe that different Greek sources have been at play, even if this may have been the case in some places. The differences between the Nayrīzī text and the Escorial text (and its sister version, the Uppsala manuscript) call for further explanation. The

contains errors caused by faulty manuscripts or by the actual editors. However, for the purpose of the present study, such shortcomings may be temporarily disregarded. The intention is to find systemic structures and operative principles for the rendering of pragmatic particles, and I believe that some significant conclusions on this may be drawn in spite of the relative uncertainty of the actual texts.

Distribution of the Examples

Aristotle: The Physics - al-Ṭabīʾa (=Physicae Auscultationes; Samāʿ al-ṭabīʿī)

Greek: Aristotle, *The Physics, Books I-IV*, P.H. Wicksteed - F.M. Cornford, Harvard U.P./ Heinemann, Cambridge Mass. - London 1957 revised edition (Loeb Classical Library, 228).

Arabic: Arisṭūṭālīs, *al-Ṭabīʿa, tarǧamat Isḥāq ibn Ḥunayn, al-ǧuzʾ al-awwal*, ed. ʿA. Badawī, al-Qāhira 1384/1964.

Greek text, ed. Loeb 1957 Examples		Arabic text, ed. Badawi 1964 Examples	
Ar 1-6	p. 372 *supra*	Ar 1-6	p. 404
Ar 7-14	p. 372 *infra*	Ar 7-19	p. 405
Ar 15-23	p. 374 *supra*	Ar 20-29	p. 406
Ar 24-31	p. 374 *infra*	Ar 30-31	p. 407
Ar 32-38	p. 376 *supra*	Ar 32-38	p. 411
Ar 39-46	p. 376 *infra*	Ar 39-49	p. 412
Ar 47-53	p. 378 *supra*	Ar 50-52	p. 413
Ar 54-58	p. 382 *supra*	Ar 53-59	p. 414
Ar 59-63	p. 382 *infra*	Ar 60-69	p. 415
Ar 64-69	p. 384 *supra*		

The Elements – al-Uṣūl (=Elementa), Book I, Prop. 1; Book VI, Prop. 1.

Greek: *Euclidis Elementa*, ed. J.L. Heiberg, Teubner, Leipzig 1883-1885; Engl. transl. by R. Fitzpatrick, 2007 (online).

Arabic: MS Madrid Escorial Derenbourg 907; MS Uppsala O. Vet. 20 (see Table 1-2); *Codex Leidensis 339, 1: Euclidis Elementa ex interpretatione Al-Hadschdschadschii cum Commentarus Al-Narizii*, ed. R.O. Besthorn - J.L. Heiberg, Havnia 1893-1910 (repr. Kessinger Publ. 2010).

Abbreviations:

Ar. = Aristotle, *The Physics, Books I-IV*, P.H. Wicksteed - F.M. Cornford, Harvard U.P./Heinemann, Cambridge Mass. - London 1957 revised edition (Loeb Classical Library, 228).
Euc. = Euclid, *The Elements* (Greek and Arabic texts: Greek ed. and Engl. transl Heiberg/Fitzpatrick; Arabic = MS Madrid Escorial Derenbourg 907).
Na. =Nayrīzī (Arabic text: ed. Besthorn-Heiberg).

The categorising is not identical with the one undertaken by Denniston for particles and connectives[26] but also includes argumentative adverbs and interpersonal comments, in accordance

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analysis undertaken here will thus also shed some light on the relations between the three Euclidean texts used.

[26] For a complete list, see Denniston, *The Greek Particles*, pp. XII-XXV.

with modern systemisation of pragmatic particles, conforming to the intention expressed above in this study to show the translator's strategies for expressing text cohesion in a total perspective.

On the other hand, it should be noted that the number of particles is quite small in the text samples considered here, compared with the total amount treated by Denniston, who covers Greek literature over a very long period of time, including geographical areas and different genre (both prose and poetry).

The items occurring in the present text samples as separate entities are presented below in their most ordinary or basic meanings. Some of the most frequent particles have a vague semantic load and may be interpreted according to a wide semantic spectrum depending on the context. Unclear examples, very complex ones, or very simple ones, have not been included in the presentation below.

Textual Analysis[27]

A. Categories

Phoric adverbs

According to Denniston's definition, they have only "intensive" and "determinative" function:[28] they signal emphasis on a neighbouring syntagms or phrase, or a shift of focus in the line of discourse, but carry no specific semantic load in addition to those functions. It is the abundance of these particles which is specifically typical of the Greek language.[29]

ἄρα	(Attic)(= οὖν), then, therefore, so then;
γε	(enclitic) at least, well then, and indeed, too;
δή	now, already, then, (belonging to preceding word), (with other particles) adds explicitness; just so, inasmuch as;
μήν	indeed, verily;
οὖν	then, therefore, accordingly, consequently.

Argumentative adverbs

These have little semantic load, yet signify something more than emphasis or focus shift, because they contain an additional sememe, e.g. a restrictive or on adversative one (they are not included in Denniston's lists).

ἐντεῦθεν	hence, thence; henceforth, thenceforth, afterwards, thereupon;
ἔτι	yet, as yet, still, besides, moreover;
καθάπερ	even as, just as;
ὥσπερ	even as, just as, as soon as, as if, as it were;
μηδέν	not at all, by no means;
πάλιν	again

Preparatory – corresponsive particles μὲν… δέ

Denniston[30] lists a few preparatory particles, and also some corresponsive ones. In this study, only the two most ordinary ones of these categories will be treated, i.e. preparatory μέν and its most

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[27] I am grateful to Prof. Karin Blomqvist for advice on the writing of Greek accents.
[28] See Denniston, *The Greek Particles*, p. XXXVIII.
[29] The meanings have been checked with Liddell & Scott 1987.
[30] See Denniston, *The Greek Particles*, p. XLII.

frequent corresponsive particle δέ. Their specific connective function is vague, but they certainly serve to organise sentences. They are considered typical of Greek (but not of other languages).

The introductory μέν signals that after the μέν phrase, another phrase will follow, which is coupled to the first one, somehow balancing its message. This second phrase is introduced by δέ. Often, the δέ phrase is adversative or restrictive towards the μέν phrase: "it is true that"… "but", "on the other hand". μέν often does not need to be explicitly translated, and the same goes for δέ to a certain extent. The construction may also occur as a simple coupling of two ideas without contradiction, in which case δέ is translated as "and".

Connectives

δέ	and, further
γάρ	for, since, as
ἀλλά	but, yet
εἴπερ	if at all events; if indeed
καί	and, also (sometimes with emphatic force)
πότερον…ἤ	whether… or
ὥς	that, so that, in order that; ὡς dem. adv. so, thus; rel. adv. as
ὥστε	so that; (adv. as)
ὡς…οὕτως	as… as

There may be some vacillation between adverbs and connectives, or adverbs and particles.

Interpersonal comments

These expressions are not included in Denniston's treatment, since they are neither particles nor connectives. They are often complete verbal phrases and add a subjective nuance to the discourse.

ἀνάγκη	it is necessary
λέγω (ὅτι)	I say (that)
φαίνεται	it is apparent
φανερόν	manifest, evident

Composite syntagms

Particles and connectives often combine with each other or with others, thus forming syntagms with a partially new meaning and function. Some of these combinations are so ordinary as to have become lexicalised, e.g.:

καί τοι, καίτοι	(conj. + enclit. part.) and indeed; and yet, although
μὲν οὖν	indeed, rather, nay rather, so too
ἀλλὰ γάρ	but really, certainly

The present texts samples contain many other (common) combinations, which are dealt with beneath under appropriate groupings.

B. Greek-Arabic Correspondences[31]

Interpersonal comments[32]

φανερὸν ὅτι	Ar 61 (it is clear that)	*zāhirun annahu*[33]
	Ar 51 (evident)	*zahira*
φαίνεται	Ar 18 (appears to)	*yazharu*
πρῶτον δὲ καλῶς	Ar 2 (it will be well to)	*wa-mā baʾsan (an naḏkura) awwalan*
ὥστε ἤτοι… ἤ	Ar 57 (so time must be either… or)	*fa-yaǧibu min ḏālika an yakūna immā… wa-immā*
ἀνάγκη	Ar 11, Ar 68 (must)	*wāǧibun ḍarūratan*
λέγω, ὅτι	Euc VI, 2	*aqūlu inna*

Argumentative adverbs

ἐντεῦθεν	Ar 62 (therefore).	*fa-l-*
ἔτι δέ	Ar 17 (nor), Ar 38 (moreover), Ar 47 (and further)	*wa-ayḍan*
καθάπερ	Ar 55 (anymore than)	*ka-ḥālin (alladīna)*
ὥσπερ οὖν	Ar 57… ἀλλά (so just as…but)	*fa-kamā (annahu)… bal*
…οὕτως ἐπεί	Ar 58 (in the same way)	*…ka-ḏālika*
μηδὲν δέ	Ar 52 (nor)	*wa-lā*
καὶ πάλιν	Euc I, 3 (and again)	*wa- … ayḍan*
		Na. *wa-ṯumma*
πάλιν, ἐπεί	Euc I, 7 (Again, since)	*wa-ayḍan li-anna*
		Na. *wa-ayḍan fa-li-anna*

Connectives

πότερον…ἤ	Ar 3 (as to… or)	*(fa-nanzuru) hal huwa… aw*
δέ according to context with several variants:		
	Ar 1, 26 (0)	*wa-*
	Ar 7, 8 (and)	*wa-*
	Ar 12 (now)	*wa-*
	Ar 13 (0)	*wa-ammā… fã*
	Ar 15 (but)	*wa-*
	Ar 21 (but)	*fa-inna*
	Ar 30 (but)	*lākinna*
	Ar 40 (0)	*wa- (hāḏā)*

Comment: "δέ" has a weak semantic load. It is often rendered with Arabic *wa-*, an exact correspondence, with a likewise semantically weak load, in English "and". However, sometimes it is

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[31] The English translation of the edition used is given in parenthesis for comparison, since it is adapted to the context and it is interesting to compare it with the pragmatic Arabic solutions.

[32] The ordering of the categories has been reversed as against the preceding pages, starting with interpersonal comments and ending with phoric adverbs, so that the category carrying the heaviest load of significance comes first.

[33] The transcription has been made with complete *iʿrāb* vowels for the convenience of the reader.

rendered by a more specific word appropriate to the specific context, e.g. *lākinna*, "but", *wa-*(*hādā*), "and this is…" when the context implies an adversative meaning. Note that the English translation follows the same strategy.

γάρ	Ar 14, 24, 56 (for)	/wa-/*dālika anna*
	Ar 28 (for)	wa-*dālika li-*
	Ar 48 (for)	wa-*dālika anna…innamā*
	Euc VI, 5 (for)	*burhānuhu anna*

Comment: "γάρ" is coordinating and causal, for which English "for" is a close correspondent. The Arabic translation consequently chooses to use a paraphrasis, with a first term marking the coordination, the continuance of the main clause with another main clause: *wa-dālika* "and that" or even *burhānuhu* "its proof is" and the second term introducing a subordinate nominal clause, *anna*, with or without the causal *li-* : *wa-dālika anna* "and that is that…".

ἀλλά		
ἀλλὰ μὴν οὐκ	Ar 27 (But neither)	wa-lā … ayḍan
ἀλλὰ μήν … γε	Ar 53 (On the other hand)	illā annahu… ayḍan
εἰ δή … ἀλλά	Ar 59 (Since then, … whereas)	fa-in … bal
ἀλλὰ μὴν καὶ ὅταν γε (γεγονέμαι)	Ar 65 (And conversely… whenever)	wa-dālika ayḍan… qad (ḥadaṯa)
εἴπερ οὖν οὐκ… ἀλλ'	Ar 25 (so that if not… but)	wa- in lam… bal…

For all examples here, see also below under Phoric adverbs.

Comment: In our material, all examples of ἀλλά occur with a phoric adverb, so that the adversatory/ excemptive force is emphasized. The emphasis has been noted by the translator and rendered by compensation, using a strong variant of "but" such as *bal*, "nay, rather", "on the other hand", or an explicatory *ayḍan* "also". The conjunction itself is differently translated according to context (as is the English choice of equivalents: "but neither"; "on the other hand"): in addition to *bal*, also *lā* "not", *illā* "except", *bal*.

ἐπεί		
ἐπεὶ δέ	Ar 42 (now…)	wa-lākinna (li-mā)
ἔπει οὖν	Ar 67 (and since)	wa-id…(see below, Phoric adverbs)
καὶ ἐπεί	Euc I, 6 (And since)	li-anna
		Na. fa-li-anna
	Euc VI, 9 (and since)	fa-
		Na. fa-min aǧli anna
	Euc VI, 32 (and since)	wa-
πάλιν, ἐπεί	Euc I, 7 (Again, since)	wa-ayḍan li-anna
		Na. wa-ayḍan fa-li-anna

Comment: "ἐπεί" has a close correspondence in Arabic *li-anna*, both being subordinating and causal. Arabic *id* is also an equivalent.

Note ἐπει δέ Ar 42 (now…) Arabic *wa-lākinna* (*li-mā*): Here, both the English and the Arabic translations have taken care to express an element of discourse breaking, which is implied by the context but not expressed in the Greek original.

Other specifications occurring together with ἐπεί are also rendered in the Arabic translation:
καί *fa-* or *wa-* (Engl. transl. "and"); πάλιν *wa-ayḍan* (Engl. transl. "again").

καί

    a) used as a simple coordinator:

καί   Euc I, 5, Euc VI, 4, Euc 6, 24 (and)   *wa-*

    b) with an emphatic force ("and also"; "in addition"; "thus, also"):

καὶ ἐπεί   Euc I, 6 (And since)   0 (*-li-anna*)
                                                                    Na. *fa* (*-li-anna*)

[ἐδείχθη] δὲ καί   Euc I, 8 (But ... was also[shown])   *wa-qad* (*nubayyinu*) *anna*
                                                                      Na. *fa-*

καί   Euc VI, 10 (and also)   *fa-... ayḍan*
καὶ εἰ…   Euc VI, 15 (and if)   *fa-in (kānat)...*
… καὶ   Euc VI, 16 / is/ also)   *... fa-(inna)*;
                                                                      Na. *immā an*

καὶ εἰ…   Euc VI, 17 (and if)   *wa-in...*
… καὶ   Euc VI, 18 (then... also)   *... fa-(huwa)*

    c) used as a preposition "as"," such as"

καί   Euc VI, 8, 9 (are also /equal/)   *ka-*
                                                                      Na. *miṯlumā*

Comment: The use of coordinators differs between Greek and Arabic. "καί" is not necessary in the beginning of a paragraph and often has a stronger potential emphasis than English "and", Arabic *wa-* or *fa-*. Arabic must have an introductory connector, even if it does not serve any other function than the marking of a new sentence, such as *wa-*. In both *wa-* and *fa-*, there may be an emphasis, as in a introductory "And" in English. "*Wa-*" is used to mark simple coordination, or even a καί with some emphasis. When καί seems to contain an "also", "in addition", the translator may use *fa-* "and thus", which is stronger than *wa-* and renders a slightly different emphasis on the consecutive rather than additive function, or he may even use an extra marker such as *qad* (denoting emphasis) or *ayḍan*, "also". If the constructions in the paragraph are obviously paralleled, repetitions of each other, as appears in our material, he may find fit to neglect marking the emphasis, since it will be apparent anyway. Thirdly, when καί is used as a preposition, the translator chooses a corresponding Arabic term. Isḥāq ibn Hunayn chooses *ka-*, whereas the Nayrīzī edition has *miṯl*, both equally adequate. Much further investigation would be fruitful here, but this will suffice to demonstrate the carefulness of the translator.

καίτοι… καί   Ar 35 (But... just as much as)   ʿalā an... ayḍan

Comment: Close correspondence: ʿalā an "yet" , *ayḍan* "/as is/ also".

ὡς… οὕτως
(ἄρα) ὡς… οὕτως   Euc VI, 31, 34, 37 (thus, as)   *fa- nisbatu-...*
       …οὕτως   (so)   *...ka-nisbati-*
with a small variation, two paralleled phrases in Euc VI, 36:
ὡς μὲν…οὕτως   (as ... so)   *kānat (nisbatu-)... ka-(nisbati-)*
… ὡς δὲ… οὕτως   (and as... so)   *...wa-(nisbatu-)... ka-(nisbati-)*

Comment: The Arabic translation does not use words similar to the Greek original, but instead a construction with nouns rendering a similar syntactic structure and an equivalent meaning: *nisbatu-*, "the relation of" *...ka-nisbati-...* "(is) like the relation of".

ὥστε	Ar 66	*fa-yağibu min ḏālika*

Comment: Instead of finding an equivalent of ὥστε, "so that", the Arabic translation chooses a paraphrasis: "thus, it is necessary because of that", which is more voluminous in textual space as well as more specific and elaborate, a sentence instead of a simple connective, and including a modal verb (a subjective element). In the second example, however, the Arabic translation is obviously elliptic.

ὅταν γάρ	Ar 44 (for when /we/)	*wa-ḏālika annā matā*

Comment: "ὅταν", whenever, seems to be straightforwardly transferred into *matā* , "when/ever/".

Phoric adverbs

ἄρα	Euc I, 9, Euc VI 31, 34, 37 (thus)	*fa-*
	Euc I, 12 (thus)	Na. *fa-...ayḍan*

Comment: ἄρα has no direct equivalent in Arabic. The English translation regularly renders it as "thus". The Arabic translator may choose to leave it out. However, more often, it is partly rendered by the coordinating connective *fa-*, "and thus", i.e., the Greek adverb is substituted by an Arabic connective containing a similar semantic load. There is a partial loss, and a shift of word class. In one case, (Na.), it has been quite explicitly rendered by *fa-* followed by an emphatic *ayḍan* ("also").

γε		
δέ γε	Ar 36 (but)	*wa-laysa*
	For Ar 53 and Ar 65, see below.	

Comment: γε has no direct equivalent in Arabic. However, the vague δέ having been strengthened by the phoric γε is expressed in the Arabic translation by changing the syntagm into a adversative coordination, *wa-laysa* (and/it is/not), quite in the same way as the English translation, which has "but".

δή	Euc VI, 13 (so)	*wa-ka-ḏālika*
	Euc VI, 21 (so)	*fa-*
εἰ δή ...ἀλλά	Ar 59 (Since then, ...whereas)	*fa-in...bal* (Cf. above)

Comment: δή has no direct equivalent in Arabic when acting as an emphasizer. However, when used as an adverb "then", it is easily translated into *fa-* ("then", "and thus"), or *wa-ka-ḏālika* ("and like that"). In the third example above, the explicatory force of δή corresponds to the strong adversative marking in Arabic protasis *fa-in*, "and thus, if"... and apodosis *...bal* "then, indeed".

μήν		
ἀλλὰ μήν	Ar 27 (But neither)	*wa-lā... ayḍan*
ἀλλὰ μήν... γε	Ar 53 (On the other hand)	*illā annahu... ayḍan*
ἀλλὰ μὴν καὶ ὅταν γε (γεγονέμαι)	Ar 65 (And conversely... whenever)	*wa-ḏālika ayḍan ... qad* (*ḥadaṯa*) (Cf. above).

Comment: μήν occurs only together with ἀλλά in our material. It is consistently rendered as *ayḍan* ("also") in the Arabic translation, thus strengthening the adversative force of the preceding ἀλλά: *wa-lā* ("and not"); *illā annahu* ("except that").

Note that γε in the last example is rendered by *qad*, in this case a precise equivalent, since *qad* may express both emphasis and concluded action.

ὅτι μὲν οὖν…ἤ …ἤ	Ar 5 (that/the following.../must...either...or)	*fa-naqūlu innahu*
		...imma... wa- immā
μὲν οὖν… δέ	Ar 23 (Now, ...but)	*wa- ... wa- ... ayḍan*
εἴπερ οὖν οὐκ... ἀλλ...	Ar 25	wa- *in lam... bal...*
	(so that if not... but)	*...fa-innahu*
ἐπεὶ οὖν	Ar 68 (and since)	*wa-iḏ...*
μὲν οὖν	(0 new paragraph)	*hāḏā mā*

Comment: οὖν has no direct equivalent in Arabic. In Greek, it is extremely frequent and has a weak semantic load, so that it is often left out in translations from Greek into other languages. In the examples Ar 25 and Ar 68, it is difficult to find any trace of the marker in Arabic, or for that matter in the English translation.

The composite syntagm μὲν οὖν ("rather, nay rather, so too") is found in several examples. Here, a stronger semantic load includes both a discourse breaking and an emphatic element, adversative or consecutive. It is rendered by Arabic consecutive connective *fa-* "and thus", English "Now", or by the discourse breaking paraphrasis *hāḏā mā* "this is what...", in English by typographical marking with the starting of a new paragraph. There is some loss, but also systematic attempts at compensation: the translator tries to mirror the lively impression of the source text.

Preparatory – corresponsive particles μὲν ... δέ[34]

μὲν... δέ	Ar 12 (... 0... and)	*baʿḍu aǧzāʾihā* (Subject)...
		...wa-baʿḍun (Subject)
	Ar 49 (0... and)	*fa-s-sarīʿu* (Subject) *huwa mā...*
		...wa-l-baṭīʾu (Subject) *huwa mā*[35]
	Euc I, 4 (0... and)	*wa-naqṣilu* X (Object)... *wa- Y* (Object)
		Na. *wa-nuḫriǧu... wa-*
	Euc VI, 1 (0... and)	*inna... wa-*
	Euc VI, 7 (0... and)	*wa-naqṣilu* X (Object)... *wa-naqṣilu* Y (Object)
		Na. *wa-nuḫriǧu... fa-naǧʿalu*
	Euc VI, 22 (0... and)	*qāʾidatāni* (Subject) ...
		...wa- muthallathāni (Subject)

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[34] The following presentation is by no means complete. Vagelpohl observes that when the antithetical sequencing is made more obvious, the μὲν... δέ construction is often rendered by *ammā... fa-* or similar terms, which constitute the second most frequent type of translation after simple omission of any sequential marking (cf. Vagelpohl, *Aristotle's Rhetoric in the East*, pp. 133f.). Gutas, in his glossary of the edition of Theophrastus, also gives many examples of renderings with *ammā... fa-* or the like (cf. Gutas, *Theophrastus, 'On First principles'*, pp. 424f.). The question will be elaborated elsewhere.

[35] The adversative paralleled subjects are further marked by explanatory *huwa mā* "this is what".

Comment: The highly frequent construction μὲν… δέ has no correspondence in Arabic, nor for that matter in English. However, there is abundant evidence that the translator has actually observed and taken pains to reproduce a similar effect in the target text.

The usual English rendering in this material is a three-phased solution: 1) to leave μέν unmarked, although often represented by a versal, signalling the start of a new sentence, 2) to keep the paralleled sentence structure of the Greek source, starting with a nominal subject and followed by a predicate, be it nominal or verbal, in both μέν and δέ - sentences, so that a paralleled sentence structure is preserved, and 3) to render δέ in the beginning of the second sentence as "and".

Now, this is very similar to the strategy employed by the Arabic translator. He starts the first of the two sentences with a *wa-* or a *fa-*, as is practically obligatory in Arabic, if no other connective is wanted from the context. Then, he constructs the two sentences, with the μέν and the δέ respectively, as nominal sentences, starting with the nominal subject and followed by the predicate. The δέ of the second sentence is usually rendered by a simple *wa-*, "and". Example: *baʿḍu aǧzāʾihā… wa-baʿḍun*, "Some of its parts (Subject)… and some (Subject)".

In English, this observance is difficult to discern, because English is a SVO language, so that the nominal subject would normally come first anyway. In Greek, the order is more flexible, making the μὲν… δέ constructions more marked. Arabic, however, is a VSO language. It is perfectly correct from a grammatical point of view to construct a sentence starting with the subject, but it is a far less common construction, thus often appearing as marked in contrast to the unmarked verbal sentence (VSO) order. So when it is constantly appearing in connection with a μὲν… δέ - construction, it means that the translator has consciously chosen this as a strategy for keeping the paralleled Greek construction.

The translator has also been careful to maintain the coupling of the two sentences, instead of paraphrasing or reordering the syntactical build up. Sometimes, this is enough to suggest the μὲν … δέ of the original (as in Euc I, 4; VI, 7), example: *wa-naqsilu… wa-naqsilu* "And we divide … and we divide". In our material, the constructions are particularly frequent in the Euclid texts, with their economical and strictly logical arrangement.

III. *A short Comparison to the Arabic Translation of the* Nicomachean Ethics.

This study is syntagmatic and context bound, and consequently based on an exhaustive investigation of a very limited material. How representative are the results of the analysis for Isḥāq ibn Ḥunayn's works in particular and for the Graeco-Arabic translator(s) in general? The limited material called for in this type of exhaustive analysis is too small to allow conclusive statements. It should be completed by paradigmatic, context free investigations on a larger material.

A starting point for further study may be found by comparing this analysis to the Arabic translation of the *Nicomachean Ethics*, another work by Aristotle. In his recent publication on Arabic versions and fragments of this work, Manfred Ullmann gives a very extensive and detailed survey of the grammar and style of the translation.[36] According to him, the Arabic translation is actually the combined work of two translators: *Books* I-IV were probably translated by Isḥāq ibn Ḥunayn (during the second half of the 9th cent.), while *Books* VI-X were translated by Eustathios (Usṭāṯ) (during the first half of the 9th cent). Ullmann devotes an introductory part of his study to the comparison between the two

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[36] M. Ullmann, *Die Nikomachische Ethik des Aristoteles in arabischer Übersetzung*. Teil I. *Wortschatz*. Teil II. *Überlieferung. Textkritik. Grammatik*, Harrassowitz, Wiesbaden 2011-2012. Here we are mainly concerned with Teil II. *Überlieferung. Textkritik. Grammatik*, to which the page numbers above refer.

translators,[37] noting a number of differences, primarily with regard to choice of nouns. In the part dealing with grammar, chapters XVI, XXI, and XXIV contain information of special relevance to this study. Although Ullmann does not treat the translation of the Greek particles as a separate entity and hardly mentions the concept of particles as such, several of his observations have a bearing on our discussion. Cf. the following examples:[38]

Greek text	(this study)	Iṣḥāq b. Ḥunayn	vs	Eustathios (Ullmann)
γάρ	*wa-ḏālika anna*	*wa-ḏālika anna*		*wa-ḏālika anna* (p. 330)
καί	*wa-; fa-; fa-... ayḍan*	*wa-;*		*wa-; fa-ayḍan* (p. 52, 351)
μὲν... δέ	—	*ammā... fa-*		*ammā... fa-* (p. 336)
ἀλλά	*wa-lā; bal;*	*wa-lākinna; bal*		*wa-lākinna; bal* (p. 330, 354)
	illā	*illā*		*illā* (p. 330)

Comment: The most ordinary and semantically heaviest loaded particles and conjunctions tend to receive a conventionalised Arabic equivalent. Examples of this is *wa-ḏālika anna* for γάρ; *illā* for ἀλλά (when denoting an exception), and *ammā... fa-* for μὲν... δέ (when those particles have a clear adversative or contrasting function, cf. n. 18 *supra*).

Particles like καί and ἀλλά (as a conjunction), which have a more complex semantic load, may be translated differently according to the context. Here, the two translators share at least one translation variant, but Iṣḥāq ibn Ḥunayn in addition gives alternative terms depending on the context.

To this information should be added the following examples of some of the more elusive Greek particles, typically phoric adverbs and the like, which I have extracted directly from *The Arabic version of the Nicomachean Ethics* by A. Akasoy and A. Fidora,[39] and from the corresponding Greek text:[40]

Greek text	(this study)	Iṣḥāq b. Ḥunayn	vs	Eustathios (Ullmann)
ἄρα	*fa-*	*fa-* (1:3 (5))		*iḏan* (8:3 (1))
δή	*fa-; wa-ka-ḏālika*	*bi-ʿaynihi* (1:3 (4))		*fa-iḏan* (8:3(1); *fa-*(8:3 (2))
ἔτι	*ayḍan*	*ayḍan* (1:3 (6))		*ayḍan* (8:1 (1))
οὖν	—	*iḏan* (1:3 (4))		*fa- iḏan* (8:3(3))
μὲν οὖν	*fa-*	*fa... qad* (1: 5 (3))		*fa-* (8:1(7))
		fa- + TOPICALISATION (1:3 (8))		

Comment: The findings are consistent with the results of the analysis of this study. All three texts indicate attempts to find equivalents of the Greek particles. It has not been confirmed that the strategies of Iṣḥāq ibn Ḥunayn in this respect are different from those of Eustathios. An interesting detail is the clear marking of the particle οὖν in the text of the *Nicomachean Ethics*.[41]

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[37] *Ibid.*, Teil II, pp. 15-56.

[38] The page numbers refer to Ullmann, *Die Nikomachische Ethik des Aristoteles in arabischer Übersetzung*,Teil II.

[39] See A. Akasoy -A. Fidora (eds.), *The Arabic Version of the Nicomachean Ethics*, Brill, Leiden-Boston 2005 (Aristoteles Semitico-Latinus, 17).

[40] Cf. Aristotle, *The Nicomachean Ethics*. With an English translation by H. Rackham, London-Cambridge Mass. 1934, 1926 (Loeb Classical Library). The reference numbers give the number of the book, the section of the book and, within parenthesis, the number of the sentence in the Arabic text. The distribution of the translation on the two translators Iṣḥāq ibn Ḥunayn and Eustathios has been maintained in accordance with the suggestion by Ullmann.

[41] A number of factors are at play regarding stylistic choices. The state of the Greek text, for example, should be noted: particles are relatively scarce in the *Nicomachean Ethics*, and a comparison among different manuscripts shows variants on the omission of particles already in Greek manuscripts (according to the notes in the Loeb edition).

IV. Conclusion

Contrastive Difficulties and translation strategies

During the last decades, Arabic scholars have established that Greek particles and connectives are often left without translation in the Arabic target texts; that this may be because they are (often) pleonastic in meaning and thus redundant; and that at least some of them are on the other hand (often) translated. Findings in a study by Vagelpohl[42] may indicate that at least some particles are translated according to load of meaning: the heavier the load of meaning, the more probable that the Greek item will be rendered in the Arabic translation. On the basis of these findings, this study proceeded to undertake a qualitative analysis of a selected material, three text samples from two different Greek authors, supposedly translated by Ḥunayn ibn Isḥāq.

Categorisation of pragmatic markers

General theories on pragmatic markers supplied the means of organising the analysis in a systematic way. Thus, the somewhat vague concept of "Greek particles /and connective" were divided into four categories: interpersonal comments, argumentative adverbs, connectives, and phoric adverbs.

The results from the categorisation roughly support the proposition based on Vagelpohl's findings. The more specific or heavier the semantic load, the more probable that the term will be translated. However, the analysis also shows that these effects are surface phenomena, reflecting a more complex net of contrastive grammatical phenomena and chosen translation strategies.

Interpersonal comments are loosely related to the surrounding text, adding a subjective element outside the flow of the syntactic and lexicological elements of discourse. Yet, they are always translated carefully with a closely correspondent term, such as *aqūlu* for λέγω ("I say"). From a perspective of contrastive grammar, a close translation is easily done: there are no difficulties transposing a personal comment, be it emotively coloured or simply neutral.

Argumentative adverbs also show a high degree of correspondence between source and target texts, e.g. πάλιν – *ayḍan* ("again, also").

In the category of connectives, the translations offer a variety of solutions ranging from zero rendering to highly specific correspondences. From a contrastive perspective, Greek connectives have equivalents of varying degrees in Arabic.

Phoric adverbs, finally, show the lowest rate of correspondences. They are often left out in the translation, most typically so with the word οὖν, a particle with a weak semantic load. Generally, Greek phoric adverbs have hardly any direct correspondences at all in Arabic, so the zero rendering in Arabic is not very surprising. The categorisation consequently corresponds to a rising scale of losses in translation. It indicates what can be expected to be closely translated and what is likely to be rendered with more or less loss, or for that matter, with some gain.

Particular Translation Strategies

A close reading of the text material regarding connectives, corresponsive particles and phoric adverbs, which are the categories that may present difficulties in the perspective of contrastive grammar, reveals that the terms chosen by the translator reflect a systematic structuring of the source text and consciously chosen solutions. The main strategies are:

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[42] Vagelpohl, *Aristotle's Rhetoric in the East*.

– *Adaption to the context.*

A Greek term with a broad and weak semantic load may be translated differently according to varying contextual situations.

The Greek coordinating connective δέ is an example of this: δέ may become *wa-*, "and", a simple unspecified coordination, in close correspondence to the Greek term, but also e.g. *fa-inna*, "and thus", "however", an adversative coordinating expression, and similarly *lākinna*, "but", adversative coordination. One particular meaning within the vague semantic content of δέ is highlighted.

– *Lexical splitting (loss - gain)*

A Greek term may have several lexicalised meanings, each of them requiring a special term in Arabic, such as Greek καί, which is consequently rendered according to its meaning.

When used as a simple conjunction "and", it is rendered as *wa-*, but when the Greek source indicates an emphatic adverbial element, "and/also", this is expressed by a corresponding argumentative adverb, typically *ayḍan*. Finally, when καί is used as a preposition, it is rendered by the corresponding Arabic *ka-* or *miṯl*, "as", "like".

– *Elaboration (explanation)*

ὥστε, "so that", is periphrastically expressed: *fa-yaǧibu min ḏālika* ("and thus, it is therefore necessary"). A gain in explicitness is achieved, although with a loss in economy.

– *Compensation*

Compensation may be more or less full or partial, but includes some loss and some shift of sememes, word class or word order.

Full compensation for γάρ, "for", is obtained by inserting a first element making the Arabic syntagm coordinating, usually *wa-ḏalika anna*, "and that is that", usually followed by a subordinated *li-anna*, "because", corresponding to the Greek term lexically but not syntactically. The Arabic solution covers the Greek term completely. It is considerably larger in volume, though, thus giving a loss of economy.

A good example of partial compensation is the Arabic rendering of the Greek connectives or corresponsive particles of μὲν... δέ. Arabic does not have anything like those particles in combination. However, the translator consciously chooses to mirror the paralleled Greek sentences, the μέν and the δέ ones respectively, and constructs them as nominal sentences, starting with the nominal subject and followed by the predicate. Since Arabic is a VSO language, constructing a sentence starting with as nominal subject often appears as marked, although not ungrammatical. Sometimes a paralleling of two verbal sentences with a *wa-* introducing the second sentence is considered enough (thus very similar to the strategy chosen by the English translator).

As for phoric adverbs, close investigation shows that the translator often tries to convey at least some of the effect of the Greek phoric adverb by compensation. A telling example is the rendering of ἄρα, "thus", with the introductory coordinating and consecutive connective *fa-*, "and thus", i.e., the Greek adverb is substituted by an Arabic connective containing a similar semantic load. Several examples involving the adverbs γε, δή, μήν, μέν and (more rarely) οὖν show that the translator uses recurrent devices to transfer at least some of the phoric load to the target text, usually by giving neighbouring connectives extra force, e.g. by inserting an *ayḍan* (also) or a *qad* (emphatic verbal particle), a discourse breaking syntagm, or the consecutive connective *fa-*.

Translator's Intention – genre and register

Summing up, the translator seems to have followed a regimen of strategies such as:

a) to translate as closely and accurately as possible;
b) thereby avoiding direct borrowing of Greek terms, instead creating Arabic correspondences;
d) to follow the rules of Arabic grammar and syntax;
c) to avoid leaving single elements without translation;
d) to translate with varieties depending on the context;
e) to find special devices to compensate for the lack of direct Arabic correspondence.

We may also conclude that the translator knows Greek very well. And he appears to be in command of correct Arabic, since he construes a language which is usually within the rules of classical Arabic, although not very elegant from a purist's point of view. It should be pointed out that this is not a case of Middle Arabic, which is characterised by a mixture of dialect and standard Arabic.[43]

The target text emerging is thus certainly Arabic, but with traces in its topography implying a Greek origin. Such typical traces are an extensive use of the connective *fa-* and other emphasising elements, e.g. *ammā* "concerning"; *ayḍan* "also", and the frequent constructions of nominal sentences, especially the syntactic mirroring of the paralleled *mubtada' - ḫabar* word order. Generally, the translator has taken pains to model the *taxis* of the source text, construing, as it seems, sentence by sentence with similar connectives. The target text is characterised by its syntactic iconicity in relation to the source text.[44]

What is the governing intention behind the careful reproduction of the Greek, or what is the effect on the reader? In my opinion, the translator has consciously created a special style, one which signals to the readers that this is a scholarly work within the Greek scientific tradition. The translator, himself a bilingual scholar, is proud of being a representative of the Greek tradition and he wants his work to carry the stylistic characteristics of Antiquity's scholars. He certainly wants to write in Arabic, but it should be Arabic in his own register and genre, the didactic Greek scholarly writing, not identical with the developments of inner Islamic discourse.[45] The Arabic scholar wanted to profile himself as belonging to a particular cultural group within the Arabo-Islamic space. Thus, a special didactic style is created, internalising the Greek heritage within Arabic proper and signalling the belonging to both socio-cultural groups, while at the same time distinguishing itself from both and standing out with its own characteristics.

A short comparison with the Arabic translations of the *Nicomachean Ethics* confirms the results of this study to a considerable extent. It also underlines the need for further investigation.

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[43] See J. Blau, *The Emergence and Linguistic Background of Judaeo-Arabic. A Study of the Origins of Middle Arabic*, Oxford U.P., Oxford 1965 (Scripta Judaica, 5).

[44] It is interesting to observe that although the Arabic translation of Theophrastus often does not show a close correspondence to the Greek source, it mirrors the extensive use of pragmatic markers in general, aiming at a syntactic similarity. Although the actual wording may be different, the characteristic style is maintained. Cf. Daiber, *Aetius Arabus* (quoted above n. 4).

[45] The translators into Arabic seem to have followed a system opposite to that of the translators into Syriac (often the same persons). Syriac translations make a rule of imitating the Greek text in detail, e.g by using Greek loan words or by creating new Syriac words (including particles) corresponding to Greek terms. Although this overall strategy may have influenced the Arabic translation tradition by facilitating the development of the Arabic strategy of creating iconic similarity, it reflects an ideology quite different from that of the Arabic scholars.

بسطح ٥ المعلومة مزيدان لعيم مثلثا متساوية في الاضلاع على خط مستقيم في لها بة معروض
عليكن الخط المستقيم ذو النهاية المعروض خط الب با وينبغي ان نقيم على خط الب با المستقيم
مثلثا متساوية في الاضلاع حتى الأعلى بذا لها ان نخط دائرة على مركز الاب وتبعد الب با وبعد اية
باجيم حال ونخط ايضا على مركز الب با وبعد با الب وبعد الب جيم ما رطل نقطة
الجيم التي تفاصلت عليها الزا يان نفكتي الاب والبا خطين مستقيمين وبما خط اجيم الب وجيم با
وانو الانا علم نا على خط الب با المستقيم في النهاية المعروض مثلثا متساوية الاضلاع ومعو مثلث الب
باجيم بر مان خط لك ان نقطة الاب مركز
دائرة باجيم دال لتكون خط الب جيم مساوية لخط
الب با واية الان ان نقطة الما مركز اية الب جيم
ما طرخط ث باجيم مساوي لخط الب با وقدتبراً ث
خط الب جيم مساوي لخط الب باعط الب جيم مساو
لخط جيم با فخطوة الب جيم وجيم با وبا الب
الثلاثة مساوية فمثلث الب باجيم متساوي في
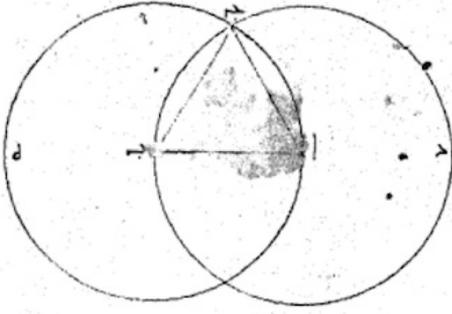
الاضلاع ومنزعلنا على خط الب باجي النهاية المعروض مثلثا متساوية الاضلاع وبه مثلث الب با
جيم وذلك ما ارد ناان نبين وو جزنا في غير عزه النسخة صناعة الثلث التساوي الساقين والمختلفة

Tab. 2. Madrid, Escorial, Derenbourg 907 (Euclid, *Elements*, Book IV, Prop. 1). © Real Biblioteca del Monasterio de San Lorenzo de El Escorial, Madrid.