Avicenna on the Quantification of the Predicate (with an Appendix on [Ibn Zurʿa])

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Abstract Avicenna (Ibn Sīnā, d. 1037) devotes two chapters of *al-'Ibāra* to the quantification of the predicate. *Al-'Ibāra* is the third treatise of the logical collection of his philosophical encyclopedia entitled *al-Shifā'* (The Cure). An English translation of these two chapters, the first in any language, is offered here. This translation is preceded by an analysis of the content of these chapters and is followed by an Appendix containing a translation of [Ibn Zurʿa]'s treatment of the same topic. (The name of Ibn Zurʿa, d. 1027, is bracketed to indicate a problem of authorship). The whole dossier is intended to pave the way for further studies of this subject. Avicenna's treatment of the quantification of the predicate has the following distinctive features: he deals systematically with singular and indefinite propositions; he states correctly the contradictories of the eight doubly quantified proposition forms which he enumerates; he is aware of the equivalence between two of these forms but makes no attempt to reduce the number of these forms to a selected basic set of them. It is suggested that Avicenna thought of the logic of doubly quantified propositions on the model of propositions with an indefinite predicate (S is not-P). Contrary to his predecessors, Avicenna did not reject a priori these proposition forms and he countered arguments supporting such a rejection.

Long before William Hamilton (1788–1856) proposed his theory of the quantification of the predicate, engaging thereby in controversy with Augustus de Morgan (1806–1871), the ancient and medieval logical tradition had already dealt with such a theory at length. Admittedly Hamilton was perfectly aware of the existence of this tradition, as shown by the informed historical notice he appended to his logical study.[1] Since then, modern scholarship has examined the treatment of this topic in the Greek and medieval Latin traditions.[2] But no study has been dedicated to the Arabic tradition. The present paper aims to pave the way for filling this lacuna.

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The discussion of the quantification of the predicate by ancient and medieval Arab commentators is generally attached to the following passage of Aristotle's *Peri Hermeneias*:

> T1: It is not true to predicate a universal universally of a subject, for there cannot be an affirmation in which a universal is predicated universally of a subject, for instance 'every man is every animal'.[3]

These few lines in Aristotle's text will be the occasion for a seven and a half page development in the Busse edition of Ammonius's Commentary[4] and for a development of about eleven pages in Avicenna's Cairo edition. Avicenna devoted to the quantification of the predicate two chapters of his *al-'Ibāra*, which is the third treatise of the logical part of his philosophical summa entitled *al-Shifā'* (The Cure). This treatise, an original and expanded exposition of the contents of Aristotle's *PH*, consists of two books; the developments on the quantification of the predicate are situated in chapters 8 and 9 of the first book.[5]

1 Singular Propositions with Quantified Individual Predicates

Avicenna is the only one among the commentators mentioned to consider systematically this class of propositions with a quantified predicate.[6] He did it perhaps for the sake of exhaustiveness. He proceeds along the following lines. Given any proposition, let us first consider its subject. It can be either singular or universal, and in the latter case, it can be taken either universally, or particularly, or else indefinitely.[7] Let us then look at the predicate. If the subject is singular, Avicenna considers here that the predicate can be either individual or universal.[8] In the three other cases, that is in the cases where the subject is a universal taken indefinitely or universally or particularly, the predicate must be universal. Avicenna examines the behaviour of all these kinds of propositions when a quantifier is prefixed to their predicate. So he was not only the sole among ancient and Arab commentators to take into account the class of singular propositions with a quantified predicate, but he was also alone in doing the same with indefinite propositions with a quantified predicate.[9]

Singular propositions with quantified predicate have, if we take as an example the case where the quantifier joined to the predicate is universal affirmative, the following form:

Zayd is every this-individual

"Zayd" is a proper name or, as Avicenna says, a "singular term", that is a term whose "signification is such that it is impossible for the mind to make it common to many items". Such a term, when used normally, that is unambiguously, indicates "the self of that which is [ostensively] designated", which self belongs uniquely to this designated object.[10] Although the predicative expression "this individual" has the appearance of a description, the fact that it contains a demonstrative makes it equivalent to a singular term such as we have just characterized it. "Every" does not signify here the whole opposed to the part, but is actually a

quantifier meaning "every instance". This kind of proposition could be explicated, following Avicenna, this way:

> Zayd is each of the things that are ones and that ʿAmr is [i.e. each of the individuals falling under ʿAmr]

Regarding these singular propositions with an individual quantified predicate, the most important point noticed by Avicenna is the *asymmetry between affirmation and negation*. The affirmation is said by him sometimes to be meaningless,[11] sometimes to be false; whereas the negation is held to be true. To make explicit the relation to truth of this last class of negative propositions, Avicenna distinguishes between the proper *content* of a proposition [*al-mafhūmāt min anfusihā*] and *what is suggested* by a proposition [*īhāmāt*].[12] The truth-value of a proposition is attached to its content, not to what it suggests. Avicenna illustrates this distinction by the example of a particular negative proposition whose terms are incompatible. So

> Not-every S is P

is true, even though what it suggests, that is:

> Some S is P

is false. For example, the particular negative "Not-every man is a stone" is true, though it suggests the particular affirmative: "Some man is a stone", which is false. In the same way, one must say that the proposition "Zayd is not every this-individual" is a true proposition, though it suggests a falsehood, namely that "this individual" has several substrates or subjects [*mawḍūʿāt*]. But, because "this individual" has not several substrates, it is true that Zayd cannot be each of them.

Avicenna mentions the following relations of contradiction between these kinds of propositions:

Zayd is every this-individual	**F**	Zayd is not-every this-individual	**T**
Zayd is some this-individual	**F**	Zayd is not some this-individual[13]	**T**

2 The Matter of Propositions

When he comes to the enumeration of singular propositions whose predicate is a quantified universal term, Avicenna makes use, in order to determine the truth-value of doubly quantified propositions (henceforth DQP), of the notion of matter (*mādda*), which he characterizes in the following way:

T. 2 Ibn Sīnā, *al-Shifāʾ: al-ʿIbāra*, I 7 (1970, 47, 3–11)

> You must know that the state of the predicate in itself with respect to the subject — not that state of which we make explicit in actuality the way it pertains to the [predicate]; nor the one which pertains to the predicate in whatever relation —, but that state which is that of the predicate with respect to the subject, in accordance with the *affirmative* relation, and which consists of perpetuity or non-perpetuity of the truth or of the falsity, [that state] is

> called matter (*mādda*). For that state which consists either in the fact that the truth of the affirmation of the predicate is perpetual and necessary — it is then called, the matter of necessity (*māddat al-wujūb*) — as is the state of the animal in respect to man; or in the fact that the falsity of the affirmation [of the predicate] is perpetual and necessary –as is the state of the stone in respect to man; or else [in the fact that] neither [this truth nor this falsity] are perpetual or necessary — this state is then called the matter of possibility (*māddat al-imkān*) — as is the state of writing in respect to man. This state is not different in the affirmation and in the negation, because this very same state belongs to the predicate of the negative proposition: this predicate is entitled to be in one of the situations just mentioned, even though it has not been the object of an affirmation.

From this rather tortuous text emerges the idea that the matter of a proposition is to be represented as its *implicit modal status*. That status arises from the kind of link existing between subject and predicate. This link is specified as soon as the *signification* of the proposition's terms is fixed, which is what Aristotle's commentators used to call the *matter* of a proposition as opposed to its *form*.[14] The assignation of a signification to the terms of the proposition entails their being subsumed under one of the predicables (genus, species, property, accident). Although he does not say it explicitly in the above text, Avicenna evidently characterizes as a matter of the necessary the matter of the proposition in which the relation between predicate and subject is one of genus to its species, or even of property to its species, as is shown by the distinction, further introduced, between the "necessary which is more general" (*al-wājib al-a'amm*) and the necessary equal (*al-wājib al-musāwī*), the first characterizing the first kind of relation, and the second the second type of relation. Avicenna characterizes as the matter of the contingent the matter of those propositions whose terms have the relation of an accident to its bearer, for example "man" and "writing", and as the matter of the impossible the matter of those propositions the terms of which are incompatible, for example "man" and "stone". As we can see, this subsuming of the concrete terms of the proposition under the different predicables confers on the notion of matter a higher abstraction: the matters then offer an interpretation allowing the determination of the truth-value of a proposition without necessarily having recourse to an assignation of a concrete signification to its compounding terms.[15]

Avicenna emphasizes that in order to determine the matter of a proposition one must take into account the affirmative link. It is not that the matter of a proposition would be changed when the latter is transformed into a negative; for then, one has to put oneself in the counterfactual situation in which one would have made an affirmation, and this will be enough to determine the matter of the examined proposition. To fix the matter by considering the affirmative link allows one to follow a more *uniform* procedure: one has not to take account of truth or falsity, perpetual or not, of the predicative link, now for the affirmation, now for the negation, but always in the first case.

As will be seen later, the propositions with a quantified predicate can be true or false in all three matters, in two of them, or in only one. Thus, the proposition "Every S is every P" is false in every matter, whereas the proposition "Every S is no P" is true only in the matter of the impossible.

Appealing to the matter of propositions with quantified predicate when their truth-value is tested is not new. Ammonius,[16] and, in a more allusive manner, the Anonymous commentator edited by Tarán,[17] did the same.

A comment is needed regarding contingent matter when the subject of the proposition is singular. For this case is ruled by the principle of indetermination in the distribution of truth-values between two singular opposite propositions in contingent matter.

Avicenna states this principle when dealing with the truth-value of propositions of the kind "Zayd is no P".

T. 3. Ibn Sīnā, *al-Shifā': al-'Ibāra*, I 8 (1970, 56, 8–12)

> But if the matter is contingent, no determinate (*bi-'aynih*) falsehood nor truth imposes itself; rather either Zayd may be, for example, writing and in that case it would be false that Zayd was no one of the writing, or Zayd may not be so, and in that case it would be true that Zayd was none of the writing. As for the proposition itself, that is its form, it does not impose anything. In sum, attributing contingent [predicates] to individuals does not impose on the propositions [where they appear] a determinate (*ta'yīn*) truth or falsehood.

The idea as well as the vocabulary used by Avicenna in this passage remind us of his discussion of future contingents. At the beginning of a section that corresponds to Aristotle's *PH* 9, Avicenna writes:

T 4. Ibn Sīnā, *al-Shifā': al-'Ibāra*, I 10 (1970, 70, 11–16)

> The situations of the contradictory [propositions] in their division of truth and falsehood among themselves [*fī iqtisāmihā al-ṣidq wa al-kadhib*] should not be the same in every case. For the truth of the quantified [*al-maḥṣūrāt*] [propositions] is determined [*yata'ayyan*] in virtue of the essence of the proposition and of the nature of the actual state of affairs. Similarly, for the singular temporal propositions which concern the past and the present, the time which obtained has of necessity made one of the two things [i.e. truth or falsehood] corresponding to the actual state of affairs.[18] Now for the singular contradictory propositions about future states of affairs, there is no necessity on the side of the natures of the states of affairs, that truth or falsehood be determined for them.

So, while contradictory propositions about the past and the present are "determinately" true or false, contradictory propositions on future contingent matters "divide the truth and falsehood among themselves", *i.e*. they have a truth-value, but *not determinately*. The pair of adverbs "determinately/not determinately" is a rendition of the pair of Greek adverbs *aphōrismenōs*/*aoristōs* used by Aristotle's ancient commentators to characterize the relation to truth and falsehood of contradictory propositions on future contingent matters.[19]

Once the notion of matter is introduced, the singular propositions whose predicate is a quantified universal term can be enumerated and their truth-value can be shown according to the matters. When the quantifier attached to the predicate is universal affirmative, the proposition is false in every matter; it is on the contrary true in every matter when the quantifier attached to the predicate is particular affirmative. When this quantifier is universal negative or particular affirmative, the proposition is sometimes true, sometimes false. In the first case, it is true in impossible matter, false in necessary matter, and it has an indeterminate truth-value in contingent matter; in the second case, it is true in necessary matter, false in impossible matter and has an indeterminate truth-value in contingent matter.

3 The Indefinite Proposition with a Quantified Predicate and the Rule of Use of the Universal Affirmative Quantifier

Avicenna characterizes the indefinite proposition as that in which "the subject is universal" and in which "the quality of the predication is revealed, but not its quantity". The indefinite proposition is therefore classically characterized by the absence of a quantifier attached to the subject. But what logical strength must then be attributed to it: that of a universal proposition or of a particular one?

To understand Avicenna's answer to this question, we should have in mind his famous doctrine of the treble status of the universal which came to be known in the Latin world as the *triplex respectus essentiae*.[20] A universal is either considered in itself as an essence or a nature, or as existing in the mind as a concept applicable to many things, or else as existing in extramental reality. Avicenna holds that an indefinite proposition in itself is neither actually universal nor particular, but is suitable to be one or the other. The subject-term of such a proposition signifies the nature in itself, which is not, as such, universal nor particular, but is suitable to be the two. The following passage from *al-ʿIbāra* I 7 shows this way of understanding the subject-term of an indefinite proposition.

T. 6. Ibn Sīnā, *al-Shifāʾ*: *al-ʿIbāra*, I 7 (1970, 48, 12–18)

> It is not because your subject is universal that the judgment you pronounce on it becomes universal, as far as you do not judge that [the predicate] belongs or does not belong to the whole of [this subject]. And if you did not judge this way, then you have judged on the nature posed for the generality [and it] alone. But this nature, taken in itself, is something; taken as general, it is another thing; and taken as particular, it is again another thing. In itself, it is suited to be considered both ways, for if it were not suited for the particularity, it would not be suited to be for example a unique humanity in virtue of which Zayd is a unique man; and if it were not suited to be general in the mind, it would not be such as many associate in it.

Now, what is the import of this doctrine on the understanding of indefinite propositions with a quantified predicate? Consider the proposition:

Man is every laughing,

the subject-term "man" may signify either the nature of man (that is Avicenna's considered doctrine), or else the "man as general" (Avicenna takes account of this possibility by way of concession). In the first case, according to Avicenna the proposition will be false. To show this, he argues by a *reductio* that if it was true, since what is true of the nature *man* is true of its instances, then a certain man would be every laughing, which is absurd. Now if the subject-term "man" is taken as general, that is as indicating the concept *man*, the proposition would again be false, because the concept *man* as such cannot be every laughing. The relation between what could be predicated of the concept *man*, *i. e.* between higher-level predicates on the one hand and the individuals which fall under the concept *man* on the other has been stated by Avicenna in *al-ʿIbāra* I 7 as follows:

T. 7. Ibn Sīnā, *al-Shifā'*: *al-'Ibāra*, I 7 (1970, 49, 8–50, 2)

> As a general item, [humanity] is [...] like a unique thing, of which is true what is not passed on to its particulars, for as general, it is a universal, a species and so on. And these are affairs which pertain to it to the exclusion of what is under it.

So what is true of *man* (or *humanity*, the difference is irrelevant here) as a concept, that it is a universal, a species and so on does not descend to the individuals which fall under it.[21]

Let us look now at the quantified predicate. "Every laughing" may be taken to mean the *class* of laughing entities. Against this point of view, Avicenna first reminds the reader of the *distributive* use of the universal affirmative quantifier, which according to him excludes the understanding of "every laughing" as the designation of a predicate-class. He then agrees to consider, for the sake of argument, this manner of understanding the quantified predicate. But then, either we take the subject-term "man" to signify the "general man" or else to signify "the nature of man without adding a condition of generality or particularity". Avicenna discards the first possibility by merely asserting that the generality of man does not consist in the fact that *man* would be identical with the class of laughing entities. And he rejects the second possibility by pointing out that while it is not the case that each instance of *laughing* is describable by the *class* of laughing entities, each instance of *man* is describable by the nature of man.

In the beginning of chapter 9, at p. 59, 7–8, Avicenna observes that one could be tempted to consider as true in necessary matter the proposition "Every man is every laughing", but that, in so doing, one would fall into an error already exposed. This alludes to the passage in the previous chapter we just summarized. Those who consider as true the proposition "Every man is every laughing" understand it as stating that the class of all men is identical to the class of all laughing people. But for Avicenna such an understanding is a mistake, because it violates his stipulation as to the correct use of the universal affirmative quantifier, a stipulation which lays down that "every man" or "every laughing" should be taken distributively and not collectively.

4 The Quantified Propositions with a Quantified Predicate

Avicenna enumerates eight DQPs schemata and gives, for each schema, four examples covering the matters of the necessary (the examples of the general necessary and of the equal necessary are very often grouped together), of the contingent and of the impossible.

1) Every S is every P

ex: Every man is every animal *or* every laughing
ex: Every man is every stone
ex: Every man is every writing

2) Every S is no P

ex: every man is no animal *or* no laughing
ex: Every man is no writing
ex: Every man is no stone

3) Every S is some P

ex: Every man is some animal *or* some laughing
ex: Every man is some writing
ex: Every man is some stone

4) Every S is not-every P

ex: Every man is not-every animal *or* not-every laughing
ex: Every man is not-every stone
ex: Every man is not-every writing

5) No S is every P

ex: No man is every animal *or* every laughing
ex: No man is every stone
ex: No man is every writing

6) No S is no P

ex: No man is no animal *or* no laughing
ex: No man is no writing
ex: No man is no stone

7) No S is some P

ex: No man is some animal *or* some laughing
ex: No man is no writing
ex: No man is some stone

8) No S is not-every P

ex: No man is not-every animal *or* not-every-laughing
ex: No man is not-every writing
ex: No man is not every stone

The order of the enumeration of these eight propositions is similar to the order we find in Ammonius.[22] But, unlike Ammonius, Avicenna does not list the other eight propositions that can be found in the former. He proposes instead a rule to determine the truth-value of these other eight propositions by taking account of the relation of *contradiction* to the eight already enumerated:

T 8. Ibn Sīnā, *al-Shifā'*: *al-'Ibāra*, I 9 (1970, 62, 2–6)

Now if the quantifier joined to the subject is particular affirmative, it will be false wherever [that proposition] is true to the subject of which is joined a negative universal quantifier—provided the [latter proposition] agrees with [the former] in all [other] circumstances; and it will be true wherever the [latter] is false. Test it yourself. […] Now if the quantifier joined

> to the subject is particular negative, then it will be true wherever that proposition is false to the subject of which is joined a universal affirmative quantifier—provided the [latter proposition] equals [the former] with regard to the predicate. Test it yourself.

One could be tempted to think that Avicenna's procedure is somewhat empirical, as suggested by the sentence inviting the reader to test by himself the validity of the rule proposed. But, first, this testing follows a systematic procedure, since it amounts to verifying the truth-value of the particular propositions with a quantified predicate in the three matters and to ascertaining in each case that they are true where the corresponding universal propositions are false and *vice-versa*. Then Avicenna could have reached this result directly by having the negation act on what he considers as the main quantifier in a DQP, that is the quantifier attached to the subject-term.

Relations of *contradiction* between DQPs could be set out as follows, where ***C*** stands for "contradictory":

1) Every S is every P ***C*** Not-every S is every P
2) Every S is no P ***C*** Not-every S is no P
3) Every S is some P ***C*** Not-every S is some P
4) Every S is not-every P ***C*** Not-every S is not-every P
5) No S is every P ***C*** Some S is every P
6) No S is no P ***C*** Some S is no P
7) No S is some P ***C*** Some S is some P
8) No S is not-every P ***C*** Some S is not-every P

The following table indicates the truth-value of the different types of DQPs: the list of Avicenna is completed by applying his rule for contradictories.

	∀/∀	∀/N	∀/∃	∀/¬∀	N/∀	N/N	N/∃	N/¬∀	∃/∀	∃/N	∃/∃	∃/¬∀	¬∀/∀	¬∀/N	¬∀/∃	¬∀/¬∀
Ne	F	F	T	T	T	T	F	F	F	F	T	T	T	T	F	T
I	F	T	F	T	T	F	T	F	F	T	F	T	T	F	T	T
C	F	F	F	T	T	F	F	F	F	T	T	T	T	T	T	T
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

∀=Every; ¬∀=Not-every; ∃=Some; N=No.
Ne=Necessary matter (includes the necessary general and the necessary equal); I=Impossible matter; C=Contingent matter.
T=True; F=False.

Avicenna has not only given the relations of contradiction between the DQPs, he was also aware of the *equipollence* of at least two of these propositions, namely:

No S is no P ≡ Every S is some P.

Thus he writes about the proposition "No S is no P" in the contingent matter:

T. 9. Ibn Sīnā, *al-Shifā'*: *al-'Ibāra*, I 9 (1970, 60, 15-61, 3)

It will be false in the contingent [matter], for it is false that no man is no writing, for this means that any man you take, it will be affirmed of him that he is some writing, since of no one of them is it true that he is no one of the writing. But this is manifestly false.

Avicenna of course was not the first to point out this equivalence between such propositions. This point came to the fore in Ammonius when he discussed the following exegetical question: Why, of all the types of DQPs, did Aristotle mention only the proposition with two universal affirmative quantifiers.[23] So also [Ibn Zurʿa], at the end of the text translated below in Appendix I, mentions as a general rule the fact that a proposition with two negations is equivalent to an affirmative proposition and gives the false following example:

Not-every S is not-every P ≡ Every S is every P[24]

Ammonius has the same false equivalence, together with the following:

Some S is every P ≡ No S is not-every P[25]

Notwithstanding the mistakes which mar them, these examples are a testimony of the efforts to establish such equivalences. It is worthwhile noting that where Avicenna mentions such an equivalence, he avoids such mistakes. Had Avicenna pursued this line, he would have established the following equivalences between the following pairs of the eight propositions he enumerated:

Every S is every P ≡ No S is not-every P
Every S is no P ≡ No S is some P
Every S is some P ≡ No S is no P
Every S is not-every P ≡ No S is every P

He would then have reduced the number of DQPs enumerated.

5 The Utility of Propositions with a Quantified Predicate

Traditionally, having enumerated the sixteen propositions with a quantified predicate and having ascertained their truth conditions, the commentators before Avicenna moved on to the topic of their utility. So did Ammonius. He distinguishes from this point of view the propositions which are always true or always false, which he considers useless, from those which are sometimes true and sometimes false, which he considers redundant since they are equivalent to and so reduce to normal propositions.

Avicenna's attitude towards this question of the utility is ambivalent: he prefaces his discussion and concludes it by protesting against those who introduced the topic of the quantification of the predicate. But when he comes to discuss the point of its utility, he protests against those who pretend that this kind of propositions should be rejected *en bloc*. He faces two objections raised by these people.

The first objection is that the truth of this kind of propositions is not a function of real states of affairs, since they could be true in different matters, that is either in the three matters of the necessary, the impossible and the contingent, or in the two matters of the necessary and the contingent. This objection is the main reason which lies behind the rejection by Ammonius of propositions with a quantified predicate which are always true:

T. 10. Ammonius, *in de int.* (1897, 106, 20–24)

> For in general those who propose to examine assertions uttered without excessive variety (*poikilia*) must reject those which are always true no less than those which are always false, as neither signifying something different in the necessary or the impossible matter nor contributing to our ability to distinguish truth and falsity. [Blank's translation]

The same reason is alleged by [Ibn Zurʿa] to reject the propositions with a quantified predicate:

T. 11. [Ibn Zurʿa], *Kitāb Bārminyās* (1994, 46, 13–18)

> We already said before that all these propositions should be rejected, because of their truth or their falsity in all the matters, or again because of their truth or falsity in two opposed matters, as in the case of the necessary and the contingent matters. But such propositions do not fit with the syllogism; only those propositions whose truth is due to real states of affairs are suitable for the syllogism, and not those whose truth is due to the discourse, to its corrupted order and to additions [made] where there is no need for them.

To this objection Avicenna answers by asserting that the truth of a proposition is due to its correspondence to facts, disregarding whether this correspondence is in one matter or in more than one. By so doing, Avicenna blurs the distinction drawn by the commentators between two kinds of DQPs: those which are always true or always false on the one hand and those which are sometimes true and sometimes false. This distinction seems to correspond to a distinction between logical truths and contradictions on the one hand and contingent truths on the other. But one must observe that the commentators did not seem to be aware that by drawing this distinction they were isolating a class of propositions that should constitute the proper object of logic, since for them this class of propositions should be excluded from the field of logic as useless. We have here a good example of the "*utilitarian* view of logic"[26] which was so common in ancient philosophy.

The second objection puts forward the impurity of the quality of DQPs, that is of their affirmative or negative nature. This alludes to those propositions in which the two quantifiers differ in quality. Avicenna upholds here a radical point of view: according to him the predicate in DQPs is constituted by the quantifier plus the initial predicate, which form together a unit. So a proposition which has the form of a normal affirmative proposition will keep this quality even though a negative quantifier has been prefixed to its predicate. The quantifier of the

predicate is conceived of as a predicate-forming operator on predicates: it generates new predicates from previous ones by attaching a quantifier to them. Indeed, the logic of the quantification of the predicate is modelled on the logic of propositions with an indefinite predicate, of the form: S is not-P. In this case too, "not-P" is conceived of as a unit, where the negation sign is a predicate-forming operator generating new predicates from previous ones. In this case too "S is not-P" is taken to be an affirmative proposition. There is a striking parallelism between the formulation of this idea in *al-ʿIbāra* I 9 and in II 1 which is about metathetic[27] propositions or propositions with an indefinite predicate.[28]

T. 12. Ibn Sīnā, *al-Shifāʾ: al-ʿIbāra*, II 1 (1970, 78, 1–8)

When the proposition becomes ternary and a negation particle is joined to it, necessarily either this negation particle is prefixed to the copula, or it is the copula which is prefixed to the negation particle. An example of the first is our saying:

Zayd is-not just;[29]

and an example of the second is our saying:

Zayd is not-just.[30]

If the negation particle is prefixed to the copula, it will negate the tie [instituted by the copula between the subject and the predicate], and that will be a true negation. While if the copula is prefixed to the negation particle, it will make it part of the predicate, so that it will not be "just" taken alone which will be the predicate, but the total sum "not-just". The word "is" will then make the total sum "not-just" affirmatively predicated of Zayd, as if one said:

Zayd is described as being not-just

and so that this [proposition] will be suited to be negated by a negation particle which will be, a second time, prefixed, [but] to the copula. One will say then:

Zayd is-not not-just.

This paradigm of metathetic propositions, on which Avicenna seems to model the logic of DQPs, allows him correctly to negate this kind of propositions, although it perhaps prevents him from recognising officially (as we saw, he recognised the fact practically) that apparently affirmative DQP have the force of negative ones and *vice-versa*.

6 Translation of Avicenna, *al-Shifāʾ*: *al-ʿIbāra* (1970, 52–65)

Book one, end of chapter seven: Making known the [different] sorts of determined, indefinite and particular propositions; the opposition which is by way of contradiction and that which is by way of contrariety, and the subalternation; and bringing the properties which pertain to propositions from this point of view

[52] The universal quantifier signifies the universality of the judgment with respect to the subject, not to the predicate. For even though the predicate is universal, the quantifier does not signify that the relation is to its universality, but rather that the relation is to the universality of the subject. So that if you say:

Every man is animal,

you do not mean that animal in its universality belongs to man, but rather that animal belongs to the universality of man. And if you need to signify that, **[53]** you will not signify it by this quantifier, but you need to bring in another word which signifies the quantity, as when you say:

Every man is every animal.

And if you take away this quantifier and thus say:

Man is every animal,

the mentioned word [of quantity] will be of no use to signify the universality of the judgment. This kind of propositions are called deviating (*munḥarifāt*), and there is no great utility in enumerating them and studying them in depth. But it is the custom to mention them; so let us examine them and make known their states.

[54] Book one, chapter eight: On deviating singular [propositions]

[The meaning of the different quantifiers]

Let us consider these [propositions, first when they are] singular, that is with a singular subject, then when they are indefinite, and then when they are determined, that is with an explicitly mentioned quantifier. [The quantifier is] that[31] word which signifies quantity, either by a universal affirmation or universal negation, or by an affirmation in part, as when you say:

"Some man is writing",[32]

or by a negation [denying] from the part, as when you say:

"Not-every man is writing" or "Not-some man is writing".

(For your denying of the whole as a whole does not prevent from your affirming in part, as when you say:

Not-every man is writing, but rather some of [them];

it is not as when you say:

No [one] man is writing,

which prevents the part. Your saying: "not-every" thus necessitates only that the generality is not, but not that the particularity is not either – this is not included in it.)

Thus we say: When we say: "Zayd" and then join to its predicate the word of quantification, it will be either the word "every" or "none" or "some" or "not-every", and the predicate will be either a universal notion or a singular notion. Now if [the predicate] is a singular notion, it is evident that prefixing to it the whole or the part in affirmation would be nonsense; unless it is meant by "whole" the sum and by "part" the part [of a whole], so that one might say for example:

This arm is the whole of these fingers, forearm and arm,

or

This arm **[55]** is part of the body,

and not the whole and the part which are the quantifiers, and with which we are dealing the way we do. In using the words "every" and "some" [as] quantifiers, we in no way think of them in that way; rather we mean by "every" not the sum but every one, and by "some" not the part, but some of what is described by the subject and shares its definition[33]. So when we say "some man" we mean but a part of the sum of men which, besides being a part, is also a man. He is therefore one of all those who are called "man" and are defined by its definition.

[Singular propositions with a quantified singular predicate]

So, if we use "every" and "some", the two quantifiers, in a singular predicate and thus say:

Zayd is every this-individual,

that is every one of that individual, it will be false; for that individual is not predicated of ones, every one of which *is* that individual. And since that is meaningless and [since] predicating it by an affirmation is not correct, its contradictory which is:

Zayd is not-every this-individual,

will be true. But if we say:

Zayd is some this-individual,

it will be false, and then its contradictory which is that:

Zayd is not some this-individual,

will be true. And if we say:

Zayd is not any this-individual,

it will be actually true although it suggests a falsehood. It suggests a falsehood, because it suggests that this-individual is general, that it has many subjects and that this is not one of them. However, one should not pay attention to the suggestions [induced by] propositions, but only to what is grasped from [the propositions] themselves. That is why our statement:

Not-every man is a stone,

will not, by suggesting that some man is a stone, become false. Likewise, if the singular is made particular negative, so that it will be said that:

Zayd is not-every this-individual,

that is, not every one of those of whom **[56]** this-individual is predicated, it will be true, even though it suggests a falsehood, namely that this-individual has many subjects. It is true just because, if this individual has not many subjects of which it would be predicated, it is then manifest that Zayd is not every one of them which are not, for the non-existent is denied of every existent without the latter being a non-existent thing. And if it is not possible for Zayd to be every one of what is ʿAmr, that is of what is not, then it will be true that Zayd is not every one of what is ʿAmr.

[Singular propositions with a quantified universal predicate]

Now if the predicate is universal, as in:

Zayd is every man *or* every animal *or* every writing,

it will be undoubtedly false. And if we say:

Zayd is no one of so-and-so,

that will be true when the matter is impossible and false when the matter is necessary. But if the matter is contingent, neither determinate falsehood nor truth imposes itself; rather either Zayd may be, for example, writing and in that case it would be false that Zayd was no one of the writing, or Zayd may not be so, and in that case it would be true that Zayd was none[34] of the writing. As for the proposition itself, that is its form, it does not impose anything. In sum, attributing contingent [predicates] to individuals does not impose on the propositions [where they appear] a determinate (*ta'yīn*) truth or falsehood.

Now if the quantifier is particular affirmative, that will be true in the matter of the necessary, as when we say:

Zayd is some man,

false in the matter of the impossible, but one has to suspend [his judgment] in the matter of the contingent.

Now if the quantifier is particular negative, as when we say:

Zayd is not-every so-and-so,

it will be true in every matter. It will be true for us to say:

Zayd is not-every animal *or* is not-every stone *or* is not-every writing.

How indeed would an individual be every instance of a universal notion?

[57] *[Indefinite propositions with a quantified predicate]*

As for the indefinite [propositions], one could opine that those in which the quantifier of the universal affirmation is joined to their predicate would be true in some occurrences as in the statement of him who states that man is every laughing. But this is a false opinion, because by "man" we mean the nature of man, while by "every laughing" we mean every one of what is laughing. But the nature of man is not describable as being every one of laughing people, for otherwise a certain man could be every one of the laughing. Similarly too, if *man* is taken inasmuch as it is general, it will not be any one of the laughing, but rather it will be the general which is predicated of each of them.[35] Now if one means by "every laughing" all the laughing, that is their sum, that will not be the way we think of quantifiers when we use them. But in spite of that, let us consider [this possibility]. Then we say: the generality of the general *man* does not consist in his being the sum of the laughing and all of them (let us accept this, for the place to elucidate it is another place), nor is the nature of man, without the addition of a condition of generality or particularity, that [sum]. How could it be, given that each one is not describable by the sum of the laughing while each one is describable by the nature of man? Now, if by "every laughing" one means the general laughing inasmuch as it is general, this is *not* what we intend and what we think of when we use the phrase "every laughing". However, it may be true to say that the general man *is* the general laughing by way of predication. But this will not be true of the nature of man, for the nature of man is *not* the general laughing; otherwise every man would be a general laughing, for the nature of man belongs to every individual. So it is for the necessary matter. As for the impossible and the contingent [matters], the falsehood [of indefinite propositions with a universal affirmative quantifier joined to the predicate] is manifest, as when we say:

Man is every stone,

or

Man is every writing,

whatever the way [these statements] are taken.

Now, if the universal quantifier is negative, it will be false in the more general necessary [matter], for if you say:

Man is no animal,

the statement will be false. **[58]** As for the necessary equal [matter], if you say that

Man is no laughing,

you may mean by "man" the general man and by the phrase "no [one] of the laughing" a denying from each of the individuals [under] "laughing". If that is what you mean, no one of the individuals posited under "laughing" will be the general man and conversely, and so the proposition will be true. But if it does not come out this way, it will be false, and that is the case where what is meant by "one of the laughing" is all that is said laughing, be it individual[36] or universal. And this is what should be grasped first from the wording of this proposition. As for the impossible [matter], it will be true in it, as when you say:

Man is no stone.

As for the contingent [matter], it will be true if you intend the subject to be the general inasmuch as it is general, as when we say:

The general man, inasmuch as it is general, is no one of the writing.

But if you mean the nature, it will be false, as when you say:

Man is no one of the writing.

Now if the quantifier is taken as particular affirmative, it will be true in the necessary general, as when you say:

Man is some animal;

but its truth is not necessary in the necessary equal, as when you say:

Man is some laughing.

For if you take the nature of man or its generality, the truth [of the proposition] will not be necessary, while if you mean a certain man — since he will also be a man — [the proposition] will be true. As for the impossible [matter], [the proposition] will be false in it, when you say:

Man is some stone.

Now if the quantifier is particular negative, it will be true in the necessary [matter], as when you say:

Man is not every animal, *or* is not every laughing,

on the account of what has been previously said. It will be also true in the impossible [matter], for man is not-every stone; and it will be also true in the contingent [matter], for man is not-every writing, as it was false that man is every writing.

Let us now deal with determined [propositions], for it was customary to deal with them to the exclusion of the other [types of propositions].

[59] Chapter nine: On the truth and falsehood of determined propositions

[I. Universal affirmative propositions with a quantified predicate]

[I. 1. The quantifier of the predicate is universal affirmative]

Now, if the subject is quantified by a universal quantifier and so is the predicate, its affirmative is not true in any matter, as when you say:

> Every man is every animal *or* is every laughing *or* every man is every stone *or* every writing.

But some people took for true our saying:

> All men are all laughing,

that is the totality of men is the totality of laughing. But you already knew what error and lapse lie in this.

[I. 2. The quantifier of the predicate is universal negative]

Now if the quantifier of the predicate is universal negative, as when you say:

> Every man is no so-and-so,

that will be false in the necessary [matter], as when you say:

> Every man is no animal *or* no laughing.

As for the contingent [matter], according to what on the face of it has been previously stated on the contingent, its particular should be necessarily true.[37] So, your statement:

> Every man is no one of the writing,

should be false too. For it is not every man who is so, but some-men-who-are-not-writing, it is those-who-are-no-one-of-the-writing; as for those-who-are-writing, they indeed are not no-one-of-the-writing, and man includes them. Unless it happens that the matter of the proposition be as we previously alluded to, if **[60]** [such a thing] is possible.[38] In this case, one has to suspend his judgment and so not judge that the statement is true or that it is false, except in determined matters.[39] But ascertaining the truth on this point pertains to a discipline different from logic.[40]

[This universal affirmative proposition with a universal negative quantifier joined to the predicate] will be true in the impossible matter, as when you say:

Every man is no stone.

[I. 3. The quantifier of the predicate is particular affirmative]

Now if the quantifier of the predicate is taken particular affirmative, as when you say:

> Every so-and-so is some so-and-so,

this will be true in the necessary general [matter] and[41] in the [necessary] equal [matter], as when we say:

> Every man is some animal *or* some laughing.

But it will be false in the contingent and the impossible [matters], as when we say:

> Every man is some writing,

or

> Every man is some stone.

[I. 4. The quantifier of the predicate is particular negative]

Now if the quantifier is taken particular negative, as when you say:

> Every man is not-every so-and-so,

this will be true in the necessary [matter], as when you say:

Every man is not-every animal *or* not-every laughing,

in the impossible [matter], as when you say:

Every man is not-every stone,

and in the contingent [matter], as when you say:

Every man is not-every writing.

[II. Universal negative propositions with a quantified predicate]

[II. 1. The quantifier of the predicate is universal affirmative]

Now, if the subject is quantified by a negative universal [quantifier], and then a universal affirmative quantifier is joined to the predicate, as when you say:

No man is every so-and-so,

this will be true in the necessary [matter], as when you say:

No man is every animal *or* every laughing,

in the impossible [matter] as when you say:

No man is every stone,

and in the contingent [matter], as when you say:

No man is every writing.

[II. 2. The quantifier of the predicate is universal negative]

Now if the quantifier joined to the predicate is taken negative universal, as when you say:

No man is no so-and-so,

this will be true in the necessary [matter], for no man is no animal or no laughing; but it will be false in the contingent [matter], for it is false that[42] no man is **[61]** no writing, for this means that any man you take, it will be affirmed of him that he is some writing, since of no one of them is it true that he is no one of the writing. But this is manifestly false. Nevertheless, the later commentator on whom these people rely has mentioned that this [proposition] is true. As for the matter of the impossible, it will be false, as when you say:

No man is no stone,

this is false.

[II. 3. The quantifier of the predicate is particular affirmative]

Now, if the quantifier joined to the predicate is taken particular affirmative, as when you say:

No man is some so-and-so,

it will be false in the necessary [matter], as when you say:

No man is some animal *or* some laughing,

and it will be false [too] in the contingent [matter], as when you say:

No man is some writing,

except on the consideration you are aware of. But it will be true in the impossible matter, as when you say:

No man is some stone.

[II. 4. The quantifier of the predicate is particular negative]

Now if the quantifier joined to the predicate is particular negative, as when you say:

No man is not-every so-and-so,

it will be false in the necessary [matter], as when you say:

No man is not-every animal *or* laughing,

And [it will be false] in the contingent [matter] too, as when you say:

No man is not-every writing,

And it will also be false in the impossible [matter], as when you say:

No man is not-every stone.

[III./IV. Particular affirmative and particular negative propositions with a quantified predicate]

[62, 2-4][43] Now if the quantifier joined to the subject is particular affirmative, it will be false wherever [that proposition] is true to the subject of which is joined a negative universal quantifier— provided the [latter proposition] agrees with [the former] in all [other] circumstances; and it will be true wherever the [latter] is false. Test it yourself.

[61,16 - 62,2] But the aforementioned commentator opined that when one says:

Some man is no writing,

that will be false. But this is the result of his inadvertence. For this is true, because the illiterate is no writing and he is some man.

[62, 4] Now if the quantifier joined to the subject is particular negative, then it will be true wherever that proposition is false to the subject of which is joined a universal affirmative quantifier — provided the [latter proposition] equals [the former] with regard to the predicate. Test it yourself.

[The utility of doubly quantified propositions]

Pay no attention to what is said about these [doubly quantified propositions], to wit, that they should be rejected and thus should not be used at all. True, that is the case for those of them which are false; as for those which are true, the quantifier is a part of the predicate in them: the quantifier and what is with it are as a single one thing which is predicated, affirmatively or negatively, of the subject. So if you find some of [these true propositions] useful somewhere, use them just as you use the other propositions in the predicate of which there is no quantifier at all.

And he who says that these [true doubly quantified propositions] are not true in virtue of the *ma'ānī* because some of them are true in the three matters and some of them are true in the necessary and the contingent[44] matters, and that they are not pure affirmatives nor pure negatives, utters nonsense. Because, first, if the predicates are divided in parts, these will have, one to another, relations which are different from the relation which is that of the proposition itself. And in this case, propositions will have, with regard to their parts, features which are different from those that belong to the predicate as a whole [related] to the subject, so that there could be a negative [relation] in [the parts] while the proposition

[itself] would be affirmative. But [these features] will not change anything to the properties which belong to the proposition inasmuch as [the predicate and the subject] are predicated and subjected in it, even though they will necessitate properties more specific and secondary [with regard to the former properties].

Regarding propositions and their use, attention should be paid to nothing but to the truth. **[63]** If they are true, use them inasmuch truth enters in them,[45] and do not pay attention to the fact that their truth is in virtue of this or that, for the true, in virtue of whatever it is, if you have to use it, will lead you to the intended aim. As for the statement of this man according to which these propositions are not true in virtue of the *ma'ānī*, if by *ma'nā* he means what is intelligible from the affirmation or the negation which are contained in the proposition, then he tells a falsehood, for the affirmation in the true among [those propositions] is true and false in the false; and if he means by *ma'nā* the form of the proposition, he [also] tells a falsehood, for the truth which occurs in this [type of proposition] depends always upon their form. As for his arguing in support of the truth of his claim by a syllogism that he constructs, it is thus: these [propositions] are true in the three matters or in two contrary matters, and what is true in this way is not true in virtue of the *ma'nā*. But the second premise is not conceded, for the true is not true at all, except for the truth of the *ma'nā*. And the true is not true and the false is not false because its truth includes its truth in the matters or not, but because it has, or on the contrary has not, a conformity and a correspondence to existence, be it in one matter or in more.

And his statement according to which [these propositions] are not pure affirmatives nor pure negatives is [also] a false statement. For the affirmation and the negation do not admit adulteration or purity, because whatever the notion which you take as predicate and about which you then judge that it belongs to the subject, that will be equally an affirmation and whatever the notion which you take as predicate and about which you then judge that it does not belong to the subject, that will be equally a negation. So if we take as a single notion our saying: "every animal", "some animal", "no animal" or "not-every animal", it will be possible to consider it, as a whole, a predicate—not as if the predicate was that part of it which is "animal" nor that which is the quantifier, but [that which is] the whole. Then, if we affirm it, it will be a true affirmation and if we deny it, it will be **[64]** a true negation, and we have besides that to make the affirmation and the negation universal or particular. Further, one should not opine that these matters are the matters of the propositions, rather they are the matters of the parts of the predicate. So, when we say:

> Every man is no animal,

the matter of this predicate is the impossible, even though the matter of a part of it, to wit "animal", is the necessary. It is not "animal" which is the predicate, so that consideration should be taken of its matter, so that when a proposition would be, for example, true in matters which are not the matters of the proposition, but the matters of its parts, its truth would be impugned and would deserve to be rejected. To such things as these no attention should be paid.

[Quantified propositions with a pseudo-quantified predicate]

As for he who says that the universal quantifier, when joined to the predicate, will be also true, as when we say:

> Every man is receptive of every art,

[he commits] a mistake too. For when one says: "in deviating propositions the quantifier is joined to the predicate", he will not be making a true statement; for the true statement about [these propositions] is that it is the quantifier with another thing that is made predicate [in them]; this other thing, had it been[46] taken alone as a predicate without a quantifier prefixed to it, would have had a property [of its own]; but when the quantifier is prefixed

to it and when that thing is joined to the quantifier and if the whole is taken as a single thing, it is then this sum which will be the predicate. It is not this thing taken apart which is alone the predicate in these propositions; but rather, this part is said to be the predicate, because the initial inquiry was about the universality of a subject and a predicate, so that it was then said that one should not look after the universality of the predicate. For the aim is not to signify that the predicate is belonging in its particularity or in its generality to the thing, but that its nature, however it is, is belonging to the thing. If you try then to add a quantifier, the proposition will be deviated: the predicate will no longer be a predicate, but rather it will become part of the predicate. The consideration of the truth will thus be transferred to the relation **[65]** which occurs between this sum and the subject. That is why these propositions were called deviating and why the First Teacher did not concern himself with them; this was rather the doing of those who came after him, who were fond of long discourses and who forced upon others to go into insignificant [inquiries] — forced as they are to agree with what [these people] nevertheless embrace in those long discourses.

As for your statement:

> Every man is receptive of every art,

the quantifier is here joined to "art"; but "art" is not the predicate which, had there not been a quantifier, would have been the predicate [of the proposition]; rather, it is a part of that predicate. And that predicate, taken completely, is your phrase "receptive of an art". If one said:

> Every man is every receptive of an art *or* of every art,

it would be a deviating [proposition]. However, the statement:

> Man is receptive of every art

does not belong to the deviating [propositions] since the quantifier is not joined to what, had there not been a quantifier, would have been a predicate, this joining being without an addition made to [the predicate].

APPENDIX I

In this Appendix, I translate a passage on the quantification of the predicate from [Ibn Zurʿa]'s Epitome of Aristotle's *PH*. This passage is interesting as another testimony, different from Avicenna's, of the treatment of this question in Arabic logical treatises. It is characterized by being more dependent on Ammonius's treatment of the subject than Avicenna's chapters. It constitutes besides a testimony of the tradition criticised in some places by Avicenna. But before briefly discussing these points, a preliminary remark is in order regarding the authorship of this Epitome.

The editors have attributed the treatises they published under the title *Ibn Zurʿa's Logic*[47] to Abū ʿAlī ʿĪsā b. Isḥāq b. Zurʿa (942–1008), a Christian Jacobite philosopher and a pupil of Yaḥyā b. ʿAdi (d. 974), the head of the so-called Baghdad school in philosophy. These treatises are epitomes[48] of the following Aristotelian books: *Peri Hermeneias*, *Prior* and *Posterior Analytics*. They seem to form parts of a more complete collection of logical treatises which includes also paraphrases of Porphyry's *Isagoge* and Aristotle's *Categories*. This collection is extant, in a more or less complete form, in many manuscripts throughout the world. The editors of *Ibn Zurʿa's Logic* settled the problem of authorship of these treatises uncritically.[49] Fortunately, we have another description of this collection by M. T. Dāneshpazhūh.[50] According to him, this collection should be attributed to Ibn Zurʿa. His judgment is based on the colophon of one of the manuscripts which he did not further identify. This colophon at the end of the Epitome of the *Categories* reads as follows: "At this point, Aristotle finishes his discourse, and thereby are perfected *The Book on the*

Ideas of the Isagoge and *The Explanation of the Purpose of Aristotle in the* Categories, [which form parts] of *The Book of the Purposes of Aristotle[’s Books] on Logic*, composed by the wise man Abū ʿAlī ʿĪsā b. Zurʿa, the Christian, born in Dhū al-Ḥijja 331 of the Hijra and dead seven days before the end of Shaʿbān 398 of this Hijra.”[51]

But it happens that this collection of logical treatises has been already “pre-empted” by modern scholarship who has attributed it to a different author[52]. Contrary to the editors of *Ibn Zurʿa’s Logic*, M. T. Dāneshpazhūh was aware of this situation and he considered that the scholars who described manuscripts containing some or all of these treatises and attributed them to a different author were wrong. Indeed, two of these manuscripts, the British Library, Or. 1561, which contains the Epitome of the *Isagoge*, and the London, India Office, Or. 3832, which contains the Epitomes of the *Isagoge*, the *Categories* and the *Posterior Analytics*, have been examined fifty years ago, by S. Stern.[53] In these two manuscripts, the beginning of the Epitome of the *Isagoge* is missing and so they show no authorship indication. But S. Stern, comparing the introductory material of this Epitome with the extant Large Commentary on the *Isagoge* by the Christian Nestorian philosopher and later representative of the Baghdad “school”, Abū al-Faraj b. al-Ṭayyib (d. 1043), concluded “that the abbreviations of the *Isagoge*, as well as those of the *Categories* and of the *Posterior Analytics*, are epitomes of Ibn al-Ṭayyib’s commentaries to these books, or epitomes of the commentaries which also served as source for Ibn al-Ṭayyib”.[54] Subsequently, in a paper published in 1974, ʿA. Badawī described the contents of a manuscript he discovered in India, which contains the entire collection of our treatises, but which once more bears no author name. Comparing here again the introductory material of the Epitome of the *Categories* with that of the Large Commentary by Abū al-Faraj b. al-Ṭayyib on this same book, ʿA. Badawī concluded that the former was an abbreviation of the latter.[55]

Then what should we conclude? The precise information contained in the colophon cited by M. T. Dāneshpazhūh constitutes, *prima facie*, a compelling argument in favour of Ibn Zurʿa’s authorship. The eminent scholar gives credence to it and seems to criticise S. Stern and ʿA. Badawī for having attributed the treatises we are dealing with to Abū al-Faraj b. al-Ṭayyib. However, the similarities underlined by these two scholars, in both content and style, between the treatises on the *Isagoge* and the *Categories* on the one hand and the extant Large Commentaries on these same books by Ibn al-Ṭayyib on the other, seem to give strong support to their conjecture.

It is not possible to settle definitely the question in the limits of this paper. It is enough for us to be aware of the difficulty; only a careful study of the treatises will allow us to reach a final conclusion.

As already told, [Ibn Zurʿa]’s treatment of the quantification of the predicate is more dependent than Avicenna’s on Ammonius. The following facts seem to confirm this statement:

(1) [Ibn Zurʿa], like Ammonius and unlike Avicenna, enumerates all sixteen DQPs. But this statement should be qualified. The eight propositions listed by Avicenna are listed in exactly the same order as by Ammonius.[56] Their method of enumeration is the same: They fix the quantifier of the subject and then vary the quantifier of the predicate, according to the order: universal affirmative, universal negative, particular affirmative, particular negative (the same order is adopted to vary the quantifier of the subject once all the possible types of quantifiers of the predicate have been listed for a given quantifier of the subject). Whereas [Ibn Zurʿa], although he announces the same enumeration method, adopts in practice a different one consisting of fixing the quantifier of the predicate and then varying that of the subject.[57]

(2) Like Ammonius, [Ibn Zurʿa] isolates the propositions which are true (respectively false) in every matter from those which are sometimes true, sometimes false.

(3) [Ibn Zurʿa] has the same justification for the falsehood of the universal affirmative proposition with a universal affirmative quantifier attached to the predicate. If every man were every animal, [Ibn Zurʿa] claims, Socrates, for instance, would be every species falling under the genus *animal*: a bird, a fox and so on. Ammonius says the same, even if his examples of species of animals that every individual would be differ: "horse, cow and all the rest."[58]

(4) Ammonius asserts that propositions with a quantified predicate are useless or redundant and that even apparently legitimate cases can be disposed of by a correct interpretation of what will then appear as a pseudo-quantifier. Examples of these cases are taken by those who put them forward from Plato and Aristotle, the two philosophical authorities for the ancient commentators. The example taken from the first is the following:

Rhetoric is some experience (*empeiria tis*)[59]

And the example taken from the second is the following:

The soul is some actuality (*entelekheia tis*)[60]

For Ammonius, in these two examples, "*tis*" does not play the role of a quantifier, but is there to show "that the predicate is not convertible with the subject but is its genus and requires the addition of some *differentiae*, in order to make the definition of the subject".[61] The whole argument of Ammonius here is reproduced by [Ibn Zurʿa], including the examples from Plato and Aristotle.

In two places in *al-ʿIbāra* I 9,[62] Avicenna, using a description as is his usual practice in the *Shifāʾ*, alludes to "the later commentator on whom these people rely" or "to the aforementioned commentator". Then when discussing the utility of DQPs, he mentions someone "who says that these [kind of propositions] are not true in virtue of the *maʿānī*, because some of them are true in the three matters and some of them are true in the necessary and the contingent matters, and that they are not pure affirmatives nor pure negatives."[63] Are the mentioned commentator and the author of the two arguments against propositions with a quantified predicate the same person? And if this is the case, is there a way to discover the identity of this person? Unfortunately the description used is not unequivocal. The formula 'later commentator' may designate an Alexandrian as well as an Arab commentator. The fact that this commentator is described as an authority for Avicenna's contemporaries and perhaps also for his immediate predecessors seems to restrict the range of possible candidates: Ammonius for the Alexandrians and some head of the Baghdad "school" for the Arabs. Here again, as in the case of the authorship of the logical treatises attributed to Ibn Zurʿa, the data at our disposal are underdetermined and do not allow us to reach a definitive conclusion. All the same it is striking to find in the following text of [Ibn Zurʿa] all the theses Avicenna alludes to. We can safely conclude that this text is at least representative of the commentary tradition countered by Avicenna.

(1) Avicenna criticises the "later commentator" for claiming that the propositions of the form:

No S is no P

are true in the contingent matter, that is in the case of propositions of the type:

No man is no writing.

This claim appears in [Ibn Zurʿa]'s text, at p. 46, 7 and 9. It does not appear in Ammonius.

(2) Avicenna criticises the same commentator for claiming that the propositions of the form:

Some S is no P

are false in the contingent matter, that is in the case of propositions of the type:

Some man is no writing.

This claim appears in [Ibn Zurʿa]'s text, at p. 46, 11 and 13. It does not appear in Ammonius.

(3) When Avicenna advises his reader to pay no attention to those who claim that propositions with a quantified predicate should be rejected, his wording matches up with [Ibn Zurʿa]'s formulation when making this very same claim:

[Ibn Zurʿa], p. 46, 13–14	Avicenna, p. 62, 6–7
Wa-qad kunnā qaddamnā al-qawla bi-anna hādhihi al-muqaddamāti mardhūlatun bi-asrihā … We already said before that all these propositions should be rejected	Thumma lā taltafit ilā mā yuqālu min anna hādhihi kullahā mardhūlatun, fa-lā tustaʿmalu al-battata. Then, pay no attention to what is said about these [doubly quantified propositions], to wit that they should be rejected and thus should not be used at all.

A parallel can also be drawn between the report by Avicenna of the first argument for rejecting propositions with a quantified predicate and the formulation of this argument by [Ibn Zurʿa] at p. 46, 14-18.

[Ibn Zurʿa], p. 46, 14–18	Avicenna, p. 62, 10–11 and 63, 7–8
… min qibali ṣidqihā fī jamīʿ al-mawādd wa-kadhibihā fī jamīʿihā, aw ṣidqihā fī māddatayni mutaqābilatayni bi-manzilat al-ḍarūrī wa-al-mumkin aw kadhibihā fī māddatayni mutaqābilatayni bi-manzilat al-ḍarūrī wa-al-mumkin. Wa-al-qiyāsu fa-lā yaṣluḥu lahu muqaddamātun shabīhatun bi-hādhihi al-ṣifa, lākin innamā yaṣluḥu lahu min al-muqqadamāti mā kāna ṣidquhu bi-sabab al-umūri. … because of their truth or their falsity in all the matters, or again because of their truth or falsity in two opposed matters, as in the case of the necessary and the contingent matters. But such propositions do not fit with the syllogism; only those propositions whose truth is due to real states of affairs are suitable for the syllogism.	Wa-alladhī qāla inna hādhihi laysat ṣādiqatan li-ajl al-maʿānī, li-anna baʿḍahā yaṣduqu fī al-mawādd al-thalāth wa baʿḍahā yaṣduqu fī al-wājibi wa al-mumkin…. … inna hādhihi taṣduqu fī al-mawwād al-talāthati aw fī māddatayni mutaḍāddatayni, wa mā yaṣduqu kadhālika fa-laysa ṣādiqan fī al-maʿnā. And he who says that these [true doubly quantified propositions] are not true in virtue of the *maʿānī* because some of them are true in the three matters and some of them are true in the necessary and the contingent matters … these [propositions] are true in the three matters or in two contrary matters, and what is true in this way is not true in virtue of the *maʿnā*.

The idea, expressed by [Ibn Zurʿa], that propositions that are true in the three matters, or in two opposed matters, are useless for the construction of syllogisms, because their truth is not due to their correspondence with real states of affairs, appeared already in Ammonius, at least implicitly. For 'states of affairs', [Ibn Zurʿa] uses the Arabic *amr*, pl. *umūr*. The word used by Avicenna instead is *maʿnā*, pl. *maʿānī*. The two words have been used by Isḥāq b. Ḥunayn (d. 910), who translated in Arabic the *PH*, to render the Greek word *pragma*. So, at *PH* 1, 16a7, *pragmata* is rendered in Arabic as *maʿānī,*[64] whereas, when the same Greek word occurs in *PH* 9, 18b38 and 19a33, it is translated by *umūr*. This last occurrence is interesting because it appears in a sentence which expresses the idea that the truth of propositions depends on real states of affairs. Aristotle says that "*hoi logoi alētheis hōsper ta pragmata*",[65] what Isḥāq translates as "*kānat al-aqāwīlu al-ṣādiqatu innamā tajrī ʿalā ḥasabi mā ʿalayhi al-umūru*".[66] It is probable that Avicenna read in the author he criticizes *maʿānī* instead of *umūr*. It is worth noticing that he interprets it, not as real states of affairs or facts, but as an ambiguous term which can mean either the intelligible content[67] of a proposition or its form.[68]

One could be tempted to consider that we have assembled the pieces of the puzzle and that the solution to our two problems is at hand. It is a well-known fact indeed that Avicenna was critical of his contemporary Abū al-Faraj b. al-Ṭayyib. So we would have here an example of this attitude and this would back up the attribution of the logical treatises to Ibn al-Ṭayyib rather than to Ibn Zurʿa. Surely this possibility should be kept in mind. But one should also be alert to arguments which militate against it.

First I am not sure that Avicenna would be willing to call Ibn al-Ṭayyib "the commentator on whom these people rely", even if he is not supposed to endorse the judgment, but attributed it to others. Avicenna had a low opinion of Ibn al-Ṭayyib, especially as a philosopher, which includes his expertise in logic. He writes at the beginning of a small treatise entitled: *al-Radd ʿalā Kitāb Abī al-Faraj b. al-Ṭayyib* (Refutation of a book of Abū al-Faraj b al-Ṭayyib):

> It has already happened that we came across books composed by al-Shaykh Abū al-Faraj b. al-Ṭayyib, may God keep his high rank in medicine, and we found them, contrary to his compositions in logic, in physics and similar disciplines, sound and satisfactory, then we came across a discourse on natural faculties…[69]

Second, there are two details in Avicenna which do not match up with [Ibn Zurʿa]'s text. The first is his already mentioned use of the word *maʿānī* instead of *umūr*, and more important, the fact that he needs to interpret it. That means that he probably had this word in the text he criticises. The second detail is the following: Avicenna reports that the author he criticises constructs a syllogism in order to validate his claim that truth of DQPs does not depend on the *maʿānī*. But even though it would be possible to extract such a syllogism from [Ibn Zurʿa]'s text, it does not appear explicitly in it.

The three facts just mentioned prevent us from identifying, without further hesitation, the commentator cited by Avicenna as [Ibn Zurʿa]. One should be content with the statement that the latter is a representative of the commentary tradition from which Avicenna distances himself.

Following is the translation of [Ibn Zurʿa]'s passage on the quantification of the predicate:

[Ibn Zurʿa], *Kitāb Bārminyās* (1994, 44, 13–47, 8)

After that, Aristotle undertakes to show that one cannot join the quantifier to the predicate, but [only] to the subject. (From there the commentators drew the description of the quantifier saying that it is a word which is joined to the subject.) He shows this by a *reductio*, saying: if a quantifier[70] were added to the predicate, it would follow that, among

propositions the most worthy regarding quantity, quality and matter would be destroyed. And if the most worthy among propositions were destroyed, those which are of a lesser value would be *a fortiori* destroyed. But then if the propositions are all destroyed and are no more in a position to be true, no proposition appropriate to the syllogism will remain.

The worthy proposition which would be so destroyed, is the universal affirmative [proposition] in the necessary matter. As to knowing how it would be destroyed when a quantifier is added to [its] predicate, that can be demonstrated in the following way. Indeed, when a quantifier is added to the predicate in[71] the proposition stating: "Every man is every animal", it follows that, any one we suppose among men, he will be every animal, so that Socrates will be a winged creature, a fox, and so on. But this is unacceptable, and this unacceptable [consequence] is due to[72] the doctrine that the quantifier must be added to the predicate. Therefore, one must not add the quantifier to the predicate; it remains that it is added to the subject.

As for the commentators, they open this chapter and examine it in detail saying: if it is possible to add the quantifier to the predicate after it has been joined to the subject, let us do it. The quantifiers being four in number, one must address a given proposition which is, of course, made up of a predicate and a subject, and join to its subject one of the quantifiers, and then join [successively] to the predicate the four quantifiers, so that the proposition have two quantifiers. Sixteen propositions are thus generated by this way:

[1] Every man is every animal

[2] Some man is every animal

[3] Not-every man is every animal

[4] No man is every animal

[5] Every man is some animal

[6] Some man is some animal

[7] Not-every man is some animal[73]

[8] No man is some animal

[9] Every man is no animal

[10] Some man is no animal

[11] Not-every man is no animal

[12] No man is no animal

[13] Every man is not-every animal[74]

[14] Some man is not-every animal

[15] Not-every man is not-every animal

[16] No man is not-every animal

These are the sixteen propositions generated by adding a quantifier to the predicate so that the proposition have two quantifiers. However, unacceptable [consequences] follow from all these sixteen [propositions]. Indeed, four of them are always true, in every matter; four are false in every matter; four are true in necessary and contingent matters, and false in impossible matter; and four are false in necessary and contingent matters, and true in impossible matter. From such propositions behaving this way follow absolutely unacceptable

consequences, because they are true in one thing and in its contrary; then it would result that the judgment be true about one thing and about its contrary.

As for propositions which are false in all matters, they are four:

the first is:

[1] Every man is every animal [1];

the second is:

[2] Some man is every animal [2];

the third is:

[3] Not-every man is not-every[75] animal [15];

the fourth is:

[4] No man is not-every animal [16]

Among the four propositions true in all matters, the first is

[1] Not-every man is every animal [3];

[then we have]:

[2] Every man is not-every animal [13];

[3] No man is every animal [4]

[4] Some man is not-every animal [14]

As for the four [propositions] which are true in necessary and contingent matters, false in impossible matter, the first of them is:

[1] Every man is some animal [5];

[then we have]:

[2] Some man is some animal [6];

[3] No man is no animal [12];

[4] Every man is not-every animal [11]

As for the four [propositions] which are false in necessary and contingent matters, true in impossible matter, they are:

[1] Not-every man is some animal [7];

[2] No man is some animal [8];

[3] Every man is no animal [9];

[4] Some man is no animal [10].

We already said before that all these propositions should be rejected, because of their truth or their falsity in all the matters, or again because of their truth or falsity in two opposed matters, as in the case of the necessary and the contingent matters. But such propositions do not fit with the syllogism; only those propositions whose truth is due to real states of affairs are suitable for the syllogism, and not those whose truth is due to the discourse, to its corrupted order and to additions [made] where there is no need for them. One should know, even if talking about this we overstep the limits of our subject, that

every proposition in which we find two negations, is an affirmative[76] proposition and not a negative one. So when we say: "Not-every man is not-every animal", this proposition is equivalent to the following: "Every man is every animal".

Some people have argued this way: even when a quantifier is added to the predicate, the proposition should be true, for Aristotle and Plato have joined it to the predicate and their statements were true. So Aristotle said in the treatise *On the Soul*: "The soul is a certain *entelecheia*"[77], that is a certain perfection, and he means by "a certain perfection", some perfection, and "perfection" is predicated of the soul. As to Plato, he said that *rhetorikê*, that is the rhetoric, is a certain faculty. Thus they claimed that the phrase "a certain" is a quantifier. But this is not so. But the phrase "a certain" is to be assimilated in this occurrence to a difference, because in many occurrences this phrase serves as a difference. Thus, if we join it to "animal", it will be a substitute for "rational" or for "mortal". This is enough to remove this objection.

APPENDIX II

[Ibn Zurʿa]'s and Avicenna's discussions of the quantification of the predicate are the longest ones I am aware of in the Arabic logical tradition. Usually, the other Arab authors on logic dealt briefly with this topic and generally to dismiss it. Following are listed some of the passages I know of, recorded according to the chronological order.

– ʿAbdallah Ibn al Muqaffaʿ (d. 756): In the Compendium of the *PH* ascribed to him, he devotes about a page to the topic of the quantification of the predicate.[78]

– Al-Fārābī (d. 950): His Large Commentary on the *PH* devotes about half a page (13 lines) to this topic. [79]

– Ibn Ḥazm, (d. 1064): He devotes few lines of his *al-Taqrīb li-ḥadd al-manṭiq* (Clarification of the definitions of Logic) to this topic.[80]

– Abū al-Barakāt al-Baghdādī (d. after 1164): In his *al-Kitāb al-muʿtabar* (The Pondered Book; Part I on Logic, Book II, chap. 2) he devotes about half a page to this topic.[81]

– Averroès (d. 1198) has three lines on this subject in his *Talkhīṣ al-ʿIbāra* or Middle Commentary on the *PH*.[82]

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Notes

1. See Hamilton (1860, 509–589); for the Historical Notice of Doctrine of Quantified Predicate see esp. pp. 546–555; for De Morgan's criticisms, see *On the Syllogism: II*, in Heath (1966, 41–68) and *Logic* (ibid., 256–270). The first is a reprint of "On the Symbols of Logic, the Theory of the syllogism, and in particular of the Copula and the Application of the Theory of Probabilities to Some Questions of Evidence", which appeared in *The Transactions of the*

Cambridge Philosophical Society, IX (1856), part i, pp. 79–127 (Heath omits the part of this paper dealing with probabilities); the second is a "shortened and adapted" reprint of an article of *The English Cyclopedia*, Arts and Sciences Division, v (1860), pp. 340–354. For an account of the controversy between Hamilton and De Morgan, see Prior (1955, 146–156), and also Heath, Introduction, pp. xi–xxx.

2. For the Greek tradition, see especially the remarkable paper, curiously little quoted, of the late M. Mignucci (1983); for the Latin tradition, see (Parry 1966) and (Weidemann 1980).
3. Aristotle, *Peri Hermeneias* (henceforth *PH*) 7, 17b 12–16 (1963, 48).
4. Ammonius (1897, 101, 14–108). D. Blank (1996) has given an English translation of the part of this commentary which covers the eight first chapters of Aristotle's *PH*, and of that which covers the ninth chapter (Ammonius 1998). Two other Greek commentaries on this treatise will be mentioned further, that of Stephanos (1885), of which there is also an English translation by W. Charlton (2000); and an anonymous commentary edited by L. Tarán (1978). On the Greek tradition of the commentary on the *PH* in general, see C. Hasnaoui (2003).
5. Ibn Sīnā, *al-Shifā': al-'Ibāra* (1970, 54–65). To designate propositions with a quantified predicate Avicenna uses a seemingly technical term which is, as far as I know, unique to him in this context. Such propositions are said to be *munḥarifāt*, which I translate as "deviating". Avicenna uses in other contexts words deriving from the root ḤRF to signify (1) that the illocutionary force of a proposition is changed or (2) that the truth-value of a proposition is suspended by the introduction of a "hypothetical particle". He describes the first situation as follows: "The signification which is desired for itself (and not to provoke a reaction of the interlocutor) is [that of] the assertions (*akhbār*, or perhaps *ikhbār*, that is the act of asserting), used either normally (*'alā wajhihā*), or by being made deviating (*muḥarrafa*) as is the case with wish and astonishment, for they reduce to the assertion(s)" (*al-'Ibāra*: 31, 10–11). He describes the second situation as follows: "The unity of hypothetical propositions is due to the hypothetical link (*ribāṭ-sharṭ*), which, when joined to the antecedent […], renders it deviating (*ḥarrafahu*), by making it neither true nor false." (*al-'Ibāra*, 33, 16–34, 1). Whether (1) is reducible to (2) is not explicitly stated by Avicenna. The same semantic core, namely that a clause added to a proposition or to a part of it, makes the proposition deviate from its normal functioning, is present in the description Avicenna gives of propositions with a quantified predicate as *munḥarifāt*: "If you try then to add a quantifier, the proposition will be deviate (*inḥarafat*): the predicate will no longer be a predicate, but rather it will become part of the predicate. The consideration of the truth will thus be transferred to the relation **[65]** which occurs between this sum and the subject. That is why these propositions were called deviating" (*al-'Ibāra*: 64, 17–65, 1).
6. Ammonius mentions, *en passant*, this class of propositions. See Ammonius (1897, 106, 15–20).
7. Avicenna is of course inspired here by Aristotle's *PH* 7, 17a38-17b3 for the distinction between universal and singular subjects, and 17b5–12 for the distinction between a universal taken universally and a universal not taken universally. Avicenna extends these distinctions to the predicate and combines the two sets of properties of the subject and of the predicate.
8. For the use of individual predicates in the peripatetic tradition see the remarks of Barnes in Porphyry (2003, 325–327).
9. Ammonius also mentions this class of propositions, in the same passing way as the singular propositions with a quantified predicate. See Ammonius (1897, 106, 10–15).
10. See for this characterization of a singular term, Ibn Sīnā, *al-Shifā': al-Madkhal* I 5 (1952, 26, 18–27, 7).
11. The word *hadhr*, which literally signifies "babble" or "idle talk", must be so understood. An utterance is a *hadhr* if it makes no difference as to the information content: it is tautological or meaningless.
12. Behind this distinction lies what could be called the principle of *semantic closure* of the proposition, which is asserted elsewhere in *al-'Ibāra*, for example on p. 50, 4–8 and on p. 103. In the first passage, Avicenna aims to show that an indefinite proposition is neuter with respect to universality and particularity. He concludes this way: "Our aim was to establish

what we have shown, to wit, that the judgement on a universal [subject] without the stipulation of a generality or a particularity does not necessitate in any way generality, nor is there in it a literal indication of particularity. Rather the indication of particularity is consequent, from without, to the signification of the judgment, it is not the signification of the judgment about [the subject]. Likewise, every proposition has consequents such as [propositions resulting from] conversion and others among those you will know [later], [but all these consequents] are not the significates themselves [indicated] by the proposition".

13. The contradictory of "Zayd is some this-individual" should be "Zayd is not any this-individual". The latter is mentioned by Avicenna who gives also its truth-value; see Ibn Sīnā, *al-'Ibāra* (1970, 55, 11–13).
14. Barnes (1990, see esp. 39–53) has useful comments on the different logical contexts where this distinction appears in the ancient Aristotelian commentary tradition. The notion of the matter of a proposition as opposed to its form (*ṣūra*) or composition (*ta'līf*) appears in Avicenna's *al-'Ibāra* most explicitly in II 1 at p. 82, 6–7. Moreover, in the two chapters dedicated to the quantification of the predicate, Avicenna mentions the form of a proposition (*ṣūrat al-qaḍiyya*) on two occasions, at p. 56, 11 (see T3 below) and at p. 63, 5–6. The notion of the matter of a proposition, understood as its implicit modal status and opposed to its explicit modality (*jiha*) is found also in Avicenna's *al-'Ibāra* II 4, p. 112, 10–15.
15. It is tempting to see in the three or four matters indicated here by Avicenna an equivalent of at least four of Euler's diagrams: the matter of the necessary general corresponding to the case of the diagram in which the subject-class is included in the predicate-class; the matter of the necessary equal corresponding to the case of the diagram in which subject and predicate are coextensive; the matter of the contingent corresponding to the case of the diagram in which subject-class and predicate-class overlap; the matter of the impossible corresponding to the case of the diagram in which the subject-class and the predicate-class are mutually exclusive. Avicenna does not contemplate here the case in which the subject-class includes the predicate-class.
16. The notion of matter is introduced by Ammonius (1897, 88, 12–28); it underlies the whole development by Ammonius of the quantification of the predicate, and is expressly mentioned e.g. at pp. 103, 11; 104, 1–12; 30; 33–34.
17. Tarán (1978, 41, 6–12 and 43, 7).
18. Reading *al-amr* for *al-ākhar*.
19. On this pair of adverbs and its signification, see now Gaskin (1995, 147–184); for its Arabic equivalent in al-Fārābī who uses *'alā al-taḥṣīl* / *lā 'alā al-taḥṣīl* (*'alā ghayr al-taḥṣīl*), see al-Fārābī (1960, 81, 11–15; this pair occurs frequently in the pp. 81–98 where al-Fārābī is commenting the *PH* 9). See also Zimmermann (1981, lxvii-lxviii and the passages cited in the General Index, s.v. "true: definitely"). Avicenna prefers to use the verb *ta'ayyana* and its negation to signify this opposition.
20. The *loci classici* for this doctrine in Avicenna are *al-Shifā'*: *al-Madkhal* I 12 (1952, 65–69); *al-Shifā'*: *al-Ilāhiyyāt* V 1 (1960, 195–206).
21. See on this point Angelelli (1967, 139–149).
22. See Ammonius (1897, 102, 33–103, 24) for the eight enumerated propositions corresponding to those enumerated by Avicenna, and see 103, 24–104, 12 for the eight other ones, not directly enumerated by Avicenna.
23. Ammonius (1897, 105, 1–106, 9, for the whole discussion).
24. *Kitāb Bārminyās*, in Ibn Zurʿa (1994, 46.18–21). The equivalence, referred to the proposition with two particular negative quantifiers, should be:

    Not-every S is not-every P ≡ Some S is every P;

    and, referred to the proposition with two universal affirmative quantifiers, it should be:

    Every S is every P ≡ No S is not-every P
25. Ammonius (1897, 105.11–15) for the first equivalence, and 15-19 for the second. M. Mignucci (1983, 29–30) proposed to emend these examples to make them logically correct. The fact that the first false equivalence is found in [Ibn Zurʿa] shows that this at least has outlived Ammonius.

26. I borrow the expression from Barnes (1990, 10).
27. For this denomination which is ascribed to Theophrastus, see Fortenbaugh, Huby, Sharples, and Gutas (1992, **87 A-F**, 148–153).
28. The exact title of this chapter is: "On binary and ternary propositions; on metathetic, plain and privative propositions and on the relations that occur between the contradictories in these [three types of propositions] in [the cases where these propositions are] singular or indefinite."
29. In Arabic, the negation particle *laysa* precedes the copula which is expressed in the technical language of the philosophers by the verb *yūjadu*. The example in Arabic has the following form:
Zayd laysa yūjadu 'ādilan.
30. The negation particle attached to the initial predicate is now in Arabic *lā*. The example in Arabic is:
Zayd yūjadu lā-'ādilan.
31. P. 54, 5: Reading, with three mss., *wa-huwa* for *wa-hādhā.*
32. Avicenna says at *al-'Ibāra* (1970, 46, 12), that the proposition "every man is writing" should be understood as "every man is actually (*bi-al-fi'l*) writing".
33. In this paragraph, Avicenna uses the same words *kull* and *ba'ḍ* for the quantifiers, resp. "every" and "some" on the one hand, and for "whole" and "part" resp. on the other hand.
34. P. 56, 10: Reading, with two mss, *laysa wa-lā*, for *aw lā.*
35. P. 57, 6: *Minhā*, one would expect *minhum* in which the pl. masc. pronoun *hum* would have referred to "laughing". But this is not satisfactory either.
36. P. 58, 6: Deleting *shakhṣan*.
37. This is an allusion to the common view reported in *al-'Ibāra*, p. 47, 14–17. "As to the particular [affirmative and negative propositions], their status in the necessary and in the impossible matters is that of the two universal [propositions] (that is the affirmative is true in the necessary matter and the negative in the impossible matter). As to the contingent matter, what is commonly admitted is that they *should* both be true; but what is evident about them is that they *may* be true in the contingent matter. […] Now, that this should be necessarily is not by itself evident for the beginner". Avicenna seems to mean that although *metaphysically* there are no unrealised possibilities, this truth is not manifest for the beginner who studies logic and who has not yet reached the metaphysical truths.
38. This seems to allude to the passage which follows that quoted in the previous note, see *al-'Ibāra*, 47, 17–48, 3: "For it is not necessary, for the beginner, that the predicate which is from the matter of the contingent, be existent in some [instance] of the subject and not-existent in some of it. The beginner indeed does not disapprove of the fact that a predicate be among the remote and odd contingents, then that it happen that it does absolutely not exist, in any time, in any of the individuals of a species." Or, alternatively, it may allude to another passage of *al-'Ibāra* I 8, p. 56, 8–11, where is stated that to predicate contingents of individuals does not necessitate definiteness of truth or falsehood of the propositions in which this predication is made.
39. Matters here should not be understood as the implicit modal status of a proposition, but specific situations in which truth or falsehood can be assigned to the proposition.
40. That is, metaphysics.
41. P. 60, 5: Adding, with all mss except one, *wa* between *al-'āmm* and *al-musāwī.*
42. P. 61, 15: Delete *wa* before *laysa*.
43. I delete 61, 14–16, which is corrupted and which, once corrected, seems to duplicate 62, 2–4. Here is a translation of the corrected text of 61, 14–16: "Now if the quantifier joined to the subject (reading *bi-al-mawḍū'* for *bi-al-maḥmūl*) is affirmative particular, it will be true where the [proposition] to the subject of which is joined a universal negative (reading *kulliyyan sāliban* for *juz'iyyan mūjiban*) quantifier is false, and it will be false where the latter is true — provided that the two propositions are equal in other circumstances. Test it yourself." The passage at 61, 16–62, 2 should come immediately after any of the two passages, either at

61, 14–16 or at 62, 2–4, because it deals with a special case of the class of propositions mentioned in these passages. I have no satisfactory explanation of this paleographic accident.

44. P. 62, 11: Reading *al-mumkin* instead of *al-mumtani'*.
45. P. 63, 1: Reading *fīhā* for *fīhi*.
46. P. 64, 11: Reading with some mss. *law* for *aw*.
47. (Ibn Zurʿa 1994).
48. The treatises on *Prior* and *Posterior Analytics* are called *jawāmi'*, see Ibn Zurʿa (1994, 93, 4).
49. The editors mention that they used three manuscripts from Tehran, but we are not told which ones.
50. See Ibn al-Muqaffaʿ (1978, 36–37) of the Persian Introduction. (I am grateful to my colleague Prof. Hossein Masoumi of the Sharif University of Technology–Tehran, for his help in reading this passage.)
51. The title *The Book on the Ideas of the* Isagoge and also the title *The Book on the Purposes of Aristotle's Books on Logic* appear in the notice dedicated to Ibn Zurʿa in *al-Fihrist* of Ibn al-Nadīm, a bibliographical work written in 987. See Ibn al-Nadīm (1988, 323, 4–5).
52. This duality creates strange situations. Thus J. Lameer (1996, 90–98, esp. p. 96) who intends to give a "complete listing of all the copies of the […] Epitomes [of Ibn al-Ṭayyib's commentaries on the *Isagoge*, *Categories*, *de Interpretatione*, and *Prior* and *Posterior Analytics*] that are known to have survived", misses some of them, which yet were listed, though under Ibn Zurʿa's name, by M. T. Dāneshpazhūh; see Ibn al-Muqaffaʿ (1978, 35–37).
53. (Stern, 1957).
54. Stern (1957, 425).
55. Badawī (1974, 74).
56. Another point on which Avicenna sides with Ammonius: both of them discuss the case of what they consider as propositions with a pseudo-quantified predicate, like the following: "Every man is receptive of every science". We may call Theophrastean this type of propositions, for Theophrastus is reported to have put them forward as propositions with a quantified predicate. Then an objector alleged them as a counterexample to the thesis that propositions which have the form "Every S is every P" are always false. Both Ammonius and Avicenna dispose of this kind of propositions by showing that the second quantifier in them is not attached to the predicate, but to a *part* of it. For ascribing to Theophrastus this kind of propositions, see Fortenbaugh, Huby, Sharples and Gutas (1992, **84**, 144–146); for Ammonius's handling this issue, see Ammonius (1897, 107, 7–108, 6); for these two points, cf. Mignucci (1983, 38–40); for Avicenna's handling of the same issue, see *al-'Ibāra* (1970, 64, 8–65, 8).
57. This procedure was followed by the Tarán's Anonymous in his first list of the sixteen DQPs. This list is then duplicated. Fixing the quantifier of the predicate, Anonymous, in his first list, varies the quantifier of the subject according to the order: universal affirmative, particular negative, particular affirmative, universal negative. Anonymous adopts this order because his purpose is to list pairs of contradictories. He duplicates this list because he seems to think, like Ammonius seems to, that the contradictory of a DQP may be obtained by negating either the quantifier attached to the subject or that attached to the predicate. For these two lists, see Tarán, Anonymous in *de int*. (1978, 41–43). For the occurrence of the thesis just mentioned in Ammonius, see Ammonius (1897, 105, 21–26).
58. Ammonius (1897, 101, 17–20).
59. Gorgias, 462C. *Empeiria* is replaced in [Ibn Zurʿa] by "capacity" or "faculty" (*quwwa*).
60. *De anima*, II 2, 414a27.
61. Ammonius (1897, 106, 32–107), I quote Ammonius's sentence in Blank's translation.
62. Ibn Sīnā, *al-'Ibāra* (1970, 61, 3 and 17).
63. Ibid., 62, 10–12. Avicenna mentions again the same author at 63, 6–8 and 11.
64. See Aristotle, *Kitāb al-'Ibāra* (1980, 99, 11). It is again *ma'nā* which translates *pragma* at *PH* 3, 16b23 (1980, 102, 14), and *ma'ānī* which translates *pragmata* at *PH* 7, 17a38 and 12, 21b28 (1980, 105, 6).

65. In Ackrill's translation: "statements are true according to how the actual things are."
66. See Aristotle, *K. al-'Ibāra* (1980, 113, 1–2).
67. Ibn Sīnā, *al-'Ibāra* (1970, 63, 3-4): *al-ma'nā al-ma'qūl*.
68. Ibid., 63, 5: *ṣūrat al-qaḍiyya*.
69. The passage is quoted by Y. Mahdavi (1954, 116). This treatise of Avicenna has been published in H. Z. Ülken (1953, 66–71) (I have not seen this volume). The same low opinion Avicenna had of Ibn al-Ṭayyib is displayed in a report by a disciple of the former, see Ibn Sīnā (1992, 80–85). This passage has been translated and analysed by D. Gutas (1988, 64–72).
70. P. 44. 16: reading *al-sūr* for *ḥarf al-salb*.
71. P. 45, 1: reading *fī* for *wa*.
72. P. 45, 3: reading *jarrahā* (?) for *ḥdd-hā*.
73. P. 45. 13: reading *wāḥidan min* for *laysa kull*.
74. P. 45. 15–17: these ll. repeat ll. 13–15, they should be read as follows:
    [13] *kullu insānin laysa kulla ḥayawānin.*
    [14] *wāḥidun min al-nās laysa kulla ḥayawānin.*
    [15] *laysa kullu insānin laysa kulla ḥayawānin.*
    [16] *wa-lā wāḥidun min al-nās laysa kulla ḥayawānin.*
75. P. 46, 4: adding *laysa* before *kull*.
76. P. 46, 20: reading with the mss. *mūjiba* for *muwajjaha*.
77. P. 47, 3: reading *anṭālākhyā* for *ṭlḥnā*.
78. Ibn al-Muqaffaʿ (1978, 45–46, §§. 85–86).
79. Al-Fārābī (1960, 70, 11–24) = Zimmermann (1981, 64–65).
80. Ibn Ḥazm (1983, 195, 5–10).
81. Abū al-Barakāt al-Baghdādī (1938, 70, 12–24).
82. Ibn Rushd (1981, 72, 6–9).

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