

Future contingents in Avicenna's reworking of *De Interpretatione*

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This paper examines the influence of Aristotle's discussion on future contingents in Avicenna's reworking of *De Interpretatione*. Through a comparison of the texts of these two authors, the study draws on Paolo Crivelli's interpretation of Aristotle and conducts a close reading and commentary on the corresponding passages in Avicenna, following the structure of the chapter. While this approach may involve certain omissions and repetitions due to the reorganization of the material, these are essential to highlight Avicenna's «two-fold attitude» toward Aristotle's work, described by Bertolacci as one of «reform and abandonment, continuity and rupture, tradition and innovation»¹. This analysis aims to highlight both the continuities and divergences in their perspectives, showing how Avicenna received and transformed Aristotle's legacy within the context of medieval Islamic philosophy².

1 AMOS BERTOLACCI, *The Reception of Aristotle's Metaphysics in Avicenna's Kitāb Al-Šifā'*. A Milestone of Western Metaphysical Thought, Leiden-Boston, Brill, 2006.

2 For a thorough examination of Avicenna's engagement with the Aristotelian tradition, see: DIMITRI GUTAS, *Avicenna and the Aristotelian Tradition: Introduction to Reading Avicenna's Philosophical Works. Second, Revised and Enlarged Edition, Including an Inventory of Avicenna's Authentic Works*, Leiden-Boston, Brill, 2014.

Introduction: Aristotle's *De Interpretatione* 9 and the Rejection of Bivalence

This study opens with an examination of Aristotle's contributions. The interpretation proposed by Paolo Crivelli is representative of what is widely referred to as the "anti-realist" (or "traditional" or "standard") interpretation³. A distinguishing characteristic of anti-realist interpretations is the attribution to Aristotle of a rejection of the Principle of Bivalence. As Crivelli elucidates:

Future-tense singular assertions constitute an important and well-known case which, according to Aristotle, shows Bivalence to be false. Aristotle discusses Bivalence and future-tense singular assertions in *de Interpretatione* 9. He confronts certain arguments that assume Bivalence and conclude to Determinism. Since Aristotle regards these arguments as valid but rejects Determinism, he rejects Bivalence. Specifically, he claims that some future-tense singular assertions are sometimes neither true nor false⁴.

In *De Interpretatione* 9 (18a28-33), Aristotle draws a distinction between statements concerning the past and present and those about the future. Statements concerning the past and present possess a property linked to truth or falsity that future statements lack. This property is attributed to their capacity to be either true or false.

With regard to things that are and things that have come to be, it is then necessary that either the affirmation or the denial should be true or false, and

³ For comprehensive interpretations of Aristotle's text, see: RICHARD GOULET, *La Tradition des Commentaires Grecs sur le De Interpretatione (PH) d'Aristote jusqu'au VII S.*, in *Dictionnaire des philosophes antiques. Supplément aux trois premiers tomes publ. sous la dir. de Richard Goulet*, Paris, CNRS Éd., 2003, pp. 122-173; DOROTHEA FREDE, *The sea-battle reconsidered: A defense of the traditional interpretation*, in «Oxford Studies in Ancient Philosophy», 3, 1985, pp. 31-87, and JOHN LLOYD ACKRILL, *Aristotle's Categories and De Interpretatione*, translated by John Lloyd Ackrill, Oxford, Clarendon Press 1963.

⁴ PAOLO CRIVELLI, *Aristotle on Truth*, Cambridge, Cambridge University Press, 2004, p. 34.

with regard to universals spoken of universally it is necessary that always one should be true and the other false, and with individuals too, as we have said, while with regard to universals not spoken of universally it is not necessary (we discussed these, too). But with regard to individuals that are going to be it is not likewise⁵.

In the following passage, Aristotle presents two deterministic arguments that demonstrate how the Principle of Bivalence appears to entail necessity in future events. In the first argument (18a34), Aristotle shows that if every affirmation and negation possesses a truth-value, then for any contradictory pair of statements concerning future particulars, one statement must be true. Given the correspondence between truth and reality, the truth of whichever prediction is true necessitates the corresponding outcome, thereby eliminating chance.

The second argument (18b9) approaches determinism from a temporal perspective: since whatever occurs now could have been truly predicted to occur, and what is truly predicted cannot fail to occur, everything that happens does so necessarily. As will be subsequently noted, this latter argument's force depends not on actual predictions being made, but merely on their possibility (18b33-19a6).

While both arguments ultimately arrive at the same conclusion, they diverge in their initial premises. The first argument is initiated with the present truth of statements concerning the future, whereas the second argument is initiated with past truths about the present. Collectively, these arguments present a robust challenge to the existence of genuine contingency in future events.

Aristotle's Tripartite Solution

We will now proceed to a discussion of Aristotle's solution. According to Crivelli's interpretation, the text can be divided into three parts. In the first part (*De Interpretatione* 19a23-27), Aristotle emphasizes that af-

⁵ 18a28-33, tr. Crivelli.

firming the necessity of the present does not entail a commitment to determinism:

Now, that what is should be whenever it is, and that what is not should not be whenever it is not, is necessary, but it is not necessary that everything which is should be, nor that what is not should not be: for, that everything which is should be of necessity when it is is not the same as that everything which is should unqualifiedly be of necessity, and similarly with what is not⁶.

In the second part, Aristotle puts forth the Principle of Excluded Middle, while simultaneously cautioning against a fallacious inference, which contemporary logic would describe as distributing the necessity operator across the disjunction. To illustrate this point, consider the following example: while it is indeed the case that it is necessary that tomorrow a naval battle will either occur or not occur [formally: $N(x \vee \neg x)$], it is not true to infer that either it is now necessary that tomorrow a naval battle will occur, or it is now necessary that tomorrow a naval battle will not occur [$N(x) \vee N(\neg x)$]:

The same account applies also to the contradictory pair: it is necessary that everything should either be or not be, and either be going to be or not; but it is not necessary to divide⁷ and call one or the other necessary. For example, I mean that it is necessary that either there will be a sea-battle tomorrow or there will not be one, but it is not necessary that tomorrow a sea-battle should come to be nor that it should not come to be: however, it is necessary that one should either come to be or not come to be⁸.

⁶ Tr. Crivelli.

⁷ When Aristotle states that «it is not necessary to divide», he seems to imply that it is an invalid inference to conclude “it is necessary for a sea battle to occur” or “it is necessary for a sea battle not to occur” from “it is necessary that a sea battle either occurs or does not occur”.

⁸ (Riferimento passo di Aristotele), tr. Crivelli.

The Equimodality⁹ of Truth in Sentences and States of Affairs

At the beginning of the third part of Aristotle's solution (*De Interpretatione* 19a33-19b4), he states: «Sentences are true in the same way as the objects». This claim can be interpreted to mean that the mode by which an affirmative sentence in the present is true corresponds to the same mode in which the state of affairs it describes exists or occurs. Aristotle appears to reject the existence of “negative” states of affairs corresponding to negative sentences, as well as “future” states of affairs corresponding to future-tense sentences. If no such “negative” or “future” states of affairs exist, then the principle of “equimodality” between the truth of sentences and the reality of states of affairs can only apply to affirmative present-tense sentences.

The Failure of the Principle of Bivalence

In the midst of the third part of the text (19a36-19b4), Aristotle addresses the Principle of Bivalence, which holds that, in every pair of contradictory statements, one member is always true and the other false. He concludes that this principle admits exceptions, albeit not for the present but for what is future and contingent. Aristotle explains:

So, since sentences are true in the same way as the objects, evidently, in the case of those which are in such a condition as to be or come to be however it chances and admit the contrary states, the contradictory pair will necessarily be in the same condition. This happens with those which not always ‘are’ or not always ‘are not’: for it is necessary that one of the two members of a contradictory pair concerning these [sc. states of affairs which not always ‘are’ or not always ‘are not’] should be true or false, but it is not necessary that this one or this one should be true or false, but it is however it chances, and it is necessary that one of the two should be more true, but not already true or false. Hence, clearly, it is not necessary that of every affirmation and denial that are opposed one should be true and the other false. For with what is things work

⁹ PAOLO CRIVELLI, *Aristotle on Truth*, cit., p. 214 ss.

out differently than with what is not but can be as well as not be – with these it is as we have said¹⁰.

Avicenna's Reworking of Aristotle's *De Interpretatione* 9: 'Ibāra I.10

In this section, we will examine Avicenna's reworking of Aristotle's *De Interpretatione*, which is referred to in Arabic as 'Ibāra. This text constitutes the third book of the Logic section in *Kitāb al-Shifā'* (*The Book of the Healing*). The present study will concentrate on Chapter 10 of the first treatise of 'Ibāra, wherein Avicenna offers commentary on and a reinterpretation of *De Interpretatione* 9.

In one of the opening sections of this chapter, Avicenna examines propositions with verbs in the past and present tenses, stating:

TEXT 1

In quantified [propositions], truth and falsity are determined by the essence of the proposition and the nature of the thing. Similarly, [for] singular temporal propositions whose tenses are past or present, the time which occurred (*ḥaṣala*) has rendered one of the two things [i.e., one of the two truth values] necessarily attached (*lāḥiqa*) to the nature of the thing¹¹.

The precise interpretations of the terms “the essence of the proposition” and “the nature of the thing” in Avicenna's text remain somewhat ambiguous. According to the present author's interpretation, the essence of the proposition refers to its logical form, while the nature of the thing pertains to the implicit modal status of the predication, that is, *how* certain properties belong to a given thing.

In addition to these elements, Avicenna appears to suggest that time plays a crucial role in determining the truth value of a contingent state of affairs described by a pair of propositions with verbs in the past or present tense. Past-tense propositions, for instance, clearly de-

¹⁰ 19a23-19b4, tr. Crivelli.

¹¹ IBN SĪNĀ, *Kitāb al-Shifā'*, *Al-Manṭiq*, *Al-'Ibāra*, cit., 70.10-14.

scribe immutable events whose truth values are fixed, as these events have already occurred. Present-tense propositions, on the other hand, describe something that currently exists (or does not exist), thereby rendering it determinately true or false at the moment of predication. The term *lāḥiq* (which can also be translated as: 'added' or 'linked') is of particular significance, as it underscores the notion that the truth value is associated with or added to the nature of the thing, rather than being intrinsic to the thing itself¹². This multifaceted perspective highlights Avicenna's recognition of the interplay between the temporal dimension of propositions and their correspondence to the nature of the objects they describe. By grounding truth and falsity in the essence of propositions and the nature of things, while accounting for temporal considerations, Avicenna reaffirms a framework that integrates Aristotelian principles while embedding them within his own peculiar version of essentialism.

In the following lines, Avicenna reflects on the contingency of singular future propositions, emphasizing that, by definition, the things these propositions describe do not yet exist and, therefore, cannot determine the truth values of the propositions themselves. He writes:

TEXT 2

As for singular contradictory propositions about future things, there is no necessity in them, with respect to the natures of things, that truth or falsehood be determined; nor [does it happen that] either of them can be determined in this [i.e., in its truth value] by the obtaining (*ḥuṣūl*) of a determinate cause. For determination occurs either by virtue of the thing itself, or by the existence of a determinate cause – since it is not necessary, by virtue of its essence, that it be determined. For every necessary thing is either necessary in virtue of its essence, or it is necessary by the obtaining of a cause that necessitates it¹³.

¹² These arguments are developed in my forthcoming article, *Future Contingents in Arabic Logic*.

¹³ IBN SĪNĀ, *Kitāb al-Šifā'*, *Al-Manṭiq*, *Al-'Ibāra*, cit., 70.14-18.

When a verb is in the future tense, the truth value of a pair of singular contradictory propositions is not determined in a necessary manner. The corresponding state of affairs for one of the propositions has not yet materialized: no cause has yet brought it into being. It is only when the thing is caused and actualized that the event becomes determined, thereby verifying one side of the contradiction and falsifying the other.

It must be acknowledged that this indeterminacy is not accidental but rather inherent to the modal status of future and possible things. Their very nature dictates that the truth values of propositions describing them cannot be determined until causation brings the corresponding state of affairs into existence¹⁴.

This insight serves to reinforce Avicenna's overarching framework, in which modality and causation play a pivotal role in elucidating the relationship between propositions and their truth values. His explanation of future contingents is thus metaphysically inspired, as it draws on the concepts of absolute necessity and causation¹⁵.

To further clarify his position, Avicenna introduces two hypothetical counterfactuals that parallel Aristotle's two deterministic arguments, illustrating the implications of assigning a determinate truth value to every pair of contradictory propositions. (1) If each pair of contradictory propositions were assigned a determinate truth value *per se*, it would follow that, for any affirmation or negation concerning singular future events, one of the two would necessarily be true (cfr. *De Int.* 18a34-b9). (2) Furthermore, if the truth or falsity of such propositions were determined prior to the occurrence of the events they describe, this determination would render the existence (or non-existence) of the described things intrinsically necessary (cfr. *De Int.* 18b9-16)¹⁶.

¹⁴ See: GINEVRA TOZZI, *Future Contingents in Arabic Logic: Towards a Genealogy of Fārābī and Avicenna's Commentaries on the Ninth Chapter of De Interpretatione*, in «Bulletin de Philosophie Médiévale», forthcoming, 2025.

¹⁵ See: PETER ADAMSON, *The Arabic Sea Battle: al-Fārābī on the Problem of Future Contingents*, in «Archiv für Geschichte der Philosophie», 88/2, 2006, pp. 163-188: esp. 184-185.

¹⁶ Similar aspects are studied in GINEVRA TOZZI, *Future Contingents in Arabic Logic*, cit.

When comparing Aristotle's and Avicenna's deterministic arguments, notable similarities emerge in both their structure and philosophical content. Both texts follow a parallel logical progression: they begin by assuming that every affirmation or negation has a determinate truth value and proceed to show how this assumption leads to the conclusion that all future events must occur necessarily.

A striking point of convergence is their shared use of the "white" example to illustrate this argument. Aristotle argues that: «if it is true to say that it is white or is not white, it is necessary for it to be white or not white; and if it is white or is not white, then it was true to say or deny this» (18a34-36, tr. Ackrill). Similarly, Avicenna writes:

TEXT 3

If the thing in itself either is white *per se* or is not white *per se*, then in the statement it is true either that it is white *per se* or that it is not white, so that existence and non-existence align with truth and falsity; and so that, if the statement on that [thing] is true, the thing necessarily occurs, and if it is false, the thing does not occur at all¹⁷.

Both philosophers thus establish a direct link between truth and necessity.

Their subsequent analyses of time reveal further parallels. Both argue that present truths imply past truths about future events, creating what can be described as a chain of necessity extending from the past into the future. Aristotle says:

[...] if it is white now it was true to say earlier that it would be white; so that it was always true to say of anything that has happened that it would be so. But if it was always true to say that it was so, or would be so, it could not not be so, or not be going to be so. But if something cannot not happen it is impossible for it not to happen; and if it is impossible for something not to happen it is necessary for

¹⁷ IBN SĪNĀ, *Kitāb al-Šifāʾ*, *Al-Manṭiq*, *Al-ʿIbāra*, edited by M. Al-Ḥuḍayrī and I. B. Madkūr, Cairo, Dār al-kātib al-ʿarabī, 1970, 71.8-11.

it to happen. Everything that will be, therefore, happens necessarily. So nothing will come about as chance has it or by chance; for if by chance, not of necessity¹⁸.

Avicenna observes:

TEXT 4

We will refer shortly to the absurdities of this, namely, what follows from our saying that, if it is necessary for every affirmation or negation to be true *per se* or false *per se*, then in no thing is being and non-being permissible through correspondence [to the existent]. Rather, all things [would be] necessary. What necessitates this consequence is that in the statement, truth or falsehood are determined before [things] have occurred. It is the whiteness of Zayd that exists now, and indeed, before now, it was absolutely necessary that it should exist now, since some man might have said that it would exist¹⁹, and it would not be false but true. Therefore, the existence of this affirmed thing [becomes] necessary by virtue of this. Likewise, [it] also occurs in what lies in the future. Certainly, the thing does not become existent because it has already been held true; rather, the statement is true only because the thing itself is such. Therefore, this necessity lies in the things themselves, even if nothing is said²⁰.

Avicenna's text closely follows Aristotle's argumentative structure, particularly the use of a *reductio ad absurdum* to demonstrate the problematic consequences of attributing determinate truth values to all propositions. However, in doing so, Avicenna offers his own clarifications and philosophical refinements. A key addition in Avicenna's work is his emphasis on ontological distinctions concerning necessity, particularly his early clarification that things can be "necessary in virtue of their essence" or become necessary "by the obtaining of a cause", which serves as a premise for the present discussion (see: TEXT 2). This metaphysical framing is absent in Aristotle's text²¹.

¹⁸ 18b9-16, tr. Ackrill.

¹⁹ Cfr. *De Interpretatione*, 18b33-19a6.

²⁰ IBN SĪNĀ, *Kitāb al-Šifā'*, *Al-Mantiq*, *Al-'Ibāra*, cit., 71.14-72.8.

²¹ In Avicenna's metaphysics, the distinction between essence (*māhiyya*) and existence (*wujūd*) is central. Essences describe what a thing is, but they don't include existence

Another notable contribution by Avicenna is his assertion: «Certainly, the thing does not become existent because it has already been held true; rather, the statement is true only because the thing itself is such. Therefore, this necessity lies in the things²², even if nothing is said» (see: TEXT 4). While aligning with Aristotle in maintaining that the existence of things is not caused by true statements about them²³, Avicenna's contribution lies in his explicit grounding of necessity in the actuality of the thing itself. A close examination of texts [2] and [3] reveals Avicenna's emphasis on modalities²⁴, understood here as the

as part of their nature. Existence, by contrast, is something external, granted to an essence through a cause. This distinction shapes Avicenna's understanding of modality, particularly in his distinction between absolute necessity (*ḍarūra muṭlaqa*) and conditional necessity (*ḍarūra bi-shart*). Absolute necessity refers to what exists by virtue of its own essence, independent of any external factors, which is a defining characteristic of the Necessary Existent (*wājib al-wujūd*). In contrast, conditional necessity emerges when the condition for something's existence is fulfilled through a cause. For instance, a contingent being (*mumkin al-wujūd*) becomes necessary only when the cause that brings it into existence is in place. In this way, Avicenna ties conditional necessity to causal dependency, situating modal truths within the broader framework of ontological causation. This approach stands in contrast to that of Aristotle, who primarily treated necessity and possibility as logical relations within the structure of propositions. By contrast, Avicenna's system integrates logical analysis within a metaphysical vision that bridges essence, existence, and causation. For a broader context of Avicenna's metaphysical approach, see: MICHAEL E. MARMURA, *Avicenna's Proof from Contingency in the Metaphysics of his al-Shifā'*, in «Mediaeval Studies», 42, 1980, pp. 337-352 and ROBERT WISNOVSKY, *Avicenna's Metaphysics in Context*, Ithaca, Cornell University Press, 2003.

- 22** This statement is related to the concept of actuality, and does not imply any form of determinism, be it logical or metaphysical. See also: GINEVRA TOZZI, *Future Contingents in Arabic Logic*, cit.
- 23** A point Aristotle makes explicitly when stating that: «Nor, of course, does it make any difference whether any people made the contradictory statements or not. For clearly this is how the actual things are even if someone did not affirm it and another deny it. For it is not because of the affirming or denying that it will be or will not be the case» (18b36-8).
- 24** For comprehensive examinations of modal logic in Avicennan philosophy, see: ASAD Q. AHMED, *Avicenna's Reception of Aristotle's Modal Syllogistic*, in *Before and After Avicenna*, edited by David Reisman, Leiden, Brill, 2003, pp. 3-24, and ID., *The Jiha/*

way in which the truth value of a proposition is determined. As the chapter progresses, this emphasis grows in significance, culminating in Avicenna's discussion of conditional necessity and what we will interpret as a realist solution to the problem of future contingents.

When truth values are not determined, contradictory propositions can be configured in one of three ways: (1) both propositions are true, (2) both propositions are false, or (3) neither of the contradictory propositions is necessarily true or false at present, but each truth value is possible for either disjunct (Ibn Sīnā 1970, 72.10-14). The first two configurations are deemed "absurd", while the third is identified as the correct one.

TEXT 5

If, on the other hand, [truth and falsity] are not determined, for this case there are three configurations: the first of these is that both [contradictory propositions] share truth, the second is that both share falsity, and the third is that neither is now necessary to be true or false, rather, that²⁵ is possible in each of the two, though it is impossible for that to be in other than these two, and [it is impossible] for them to be removed together, so that truth or falsity are external to both [propositions]²⁶.

Tropos-Mādda/Hūlē Distinction in Arabic Logic and its Significance for Avicenna's Modals, in *The Unity of Science in the Islamic Tradition*, edited by Shahid Rahman, Tony Street, and Hassan Tahiri, Springer, 2008, pp. 229-253, ALLAN BÄCK, *Avicenna on Existence*, in «Journal of the History of Philosophy», 25/3, 1987, pp. 351-367 and ID., *Avicenna's Conception of the Modalities*, in «Vivarium», 30/2, 1992, pp. 217-255, SALOUA CHATTI, *Avicenna on Possibility and Necessity*, in «History and Philosophy of Logic», 34/4, 2014, pp. 332-353, WILFRID HODGES, JOHNSTON SPENCER, *Medieval Modalities and Modern Methods: Avicenna and Buridan*, in «IfCoLog Journal of Logics and their Applications», 4/4, 2017, pp. 1029-1073, HENRIK LAGERLUND, *Avicenna and Ṭūsī on Modal Logic*, in «History and Philosophy of Logic», 30/3, 2019, pp. 227-239, RICCARDO STROBINO, PAUL THOM, *The Logic of Modality*, in *The Cambridge Companion to Medieval Logic*, edited by Catarina Dutilh Novaes and Stephen Read, 2016, pp. 342-369, and PAUL THOM, *Necessity in Avicenna and the Arabic Tradition*, in *Logical Modalities from Aristotle to Carnap: The Story of Necessity*, edited by Max Cresswell, Edwin Mares and Adriane Rini, Cambridge, Cambridge University Press, 2016, pp. 91-112.

²⁵ Being true or false.

²⁶ IBN SĪNĀ, *Kitāb al-Šifāʾ*, *Al-Manṭiq*, *Al-ʿIbāra*, cit., 72.10-14.

In the parallel section of his commentary on *De Interpretatione*, al-Fārābī cites Aristotle's text as translated by Ishāq and introduces the example of a battle (not a naval battle, but a generic one). The first occurrence of this term is in *De Interpretatione* 18b23-25, as cited by al-Fārābī:

An example of this²⁷ is a battle. For it is neither necessary that it should be a battle nor that it should not be²⁸.

Similarly, at 19a28-32, al-Fārābī quotes:

For the existence or non-existence now of everything necessary, and its existence or non-existence in the future is necessary. But if we split²⁹ and maintain one of the two alternatives, it is not necessary. For example, saying that the battle³⁰ will or will not take place tomorrow is necessary, while saying that the battle will take place tomorrow is not necessary; nor is saying that it will not take place tomorrow necessary. What is necessary is that it will or will not take place³¹.

Avicenna, on the other hand, completely omits any reference to the example of a battle.

²⁷ He's referring to the contradictory propositions about future events being analyzed in his reconstruction of Aristotle's *reductio ad absurdum*. Specifically, "this" refers to the claim that if both opposites (e.g., "there will be a battle" and "there will not be a battle") were simultaneously true or false, it would result in a series of absurdities: the simultaneous existence and non-existence of an event, as well as the elimination of contingency and possibility.

²⁸ *Al-Fārābī's Commentary and Short Treatise on Aristotle's De Interpretatione*, translated by Fritz W. Zimmermann, Oxford, Oxford University Press, 1981, p. 83.

²⁹ This is a reference to the Aristotelian notion of "division", which may suggest the importance of avoiding a narrow scope for the modal operator. Interestingly, although this term appears in Aristotle's original text and is preserved in al-Fārābī's commentary, Avicenna does not incorporate it into his treatment of the issue.

³⁰ *Al-ḥarb* (war, fight, battle).

³¹ *Al-Fārābī's Commentary*, cit., p. 91.

Two observations merit attention. Firstly, Avicenna offers no examples of future states of affairs or events, either herein or in the subsequent sections of the chapter. To put it more clearly, Aristotle's example of a battle that will or will not take place is entirely absent from Avicenna's text, and no analogous example is presented. The sole exception to this is found immediately subsequent to Avicenna's presentation of the three configurations previously discussed. Rather than confining himself to pairs of contradictory propositions, he states:

TEXT 6

However, the first configuration is absurd, for both propositions would be true and false at the same time, and this is absurd. How could both be true, when truth is that which corresponds to existence? Both things would [then] exist simultaneously, and Zayd would be both white and not white, or rather: he would also be black at the same time³².

This is the only example in the chapter where Avicenna refers to actual things – or more specifically, to contrary qualities attributed to an individual – rather than focusing on pairs of contradictory propositions in the context of future contingents.

In the interest of streamlining the discussion, it is possible to observe a transition in Avicenna's discourse from a consideration of facts to the centrality of truth values within pairs of contradictory propositions. Specifically, the focus transitions from: "It is necessary that tomorrow there will or will not be a naval battle" to: "The truth or falsity of each of the two contradictory propositions is possible", or alternatively: "Each of the two truth values is possible for either disjunct."

A second, brief observation pertains to an evident shift in modality, whereby the primacy of necessity gives way to the primacy of possibility.

It is helpful to keep this in mind alongside texts [1] and [2], in which Avicenna addresses: [1] propositions in the past and present tenses, and [2] singular future-tense propositions, where he writes: «There is no necessity in them, with respect to the natures of things, that truth

³² IBN SĪNĀ, *Kitāb al-Šifā'*, *Al-Manṭiq*, *Al-'Ibāra*, cit., 72.14-17.

or falsehood be determined» (see: TEXT 2). These references will be essential for analyzing Avicenna's interpretation of future contingents, which ultimately reveals his commitment to a realist perspective. To provide some context:

Realist interpretations constitute the most authoritative alternative to my favoured exegesis. According to realist interpretations, in *Int.* 9 Aristotle does not reject Bivalence. Rather, he distinguishes ways in which tensed assertions have whatever truth-value they have: all past- and present-tense assertions have their truth-values *necessarily*, some future-tense singular assertions have them *contingently*³³.

This argument will be explored in greater depth and further substantiated later in the discussion, after examining the remaining passages of the chapter.

Let us return to Avicenna's text: at this point, he argues for the existence of contingency and our capacity for deliberation, and advocates the exclusion of metaphysical arguments from logic. Specifically, he suggests that investigating the nature of necessity and possibility, as well as establishing the existence of contingency, belongs to the realm of metaphysics.

The logician's goal, by contrast, is to understand the truth value of a proposition and *how* it is determined. Additionally, the logician must recognize that: «in some things, determination requires an absurdity that stubbornly resists what is evident and commonly accepted» (Ibn Sīnā 1970, 74.3-4). Here, Avicenna refers to the conditional necessity of contingent entities. In this context, the condition a thing must satisfy is the existence of predication, that is, the fact that the predication subsists or is actualized:

33 PAOLO CRIVELLI, *Aristotle on Truth*, cit., p. 227; See also: VITTORIO SAINATI, *Storia dell'«Organon» aristotelico*, Firenze, Le Monnier, 1968, pp. 240-261; ALLAN BÄCK, *Sailing through the Sea Battle*, in «Ancient Philosophy», 12, 1992, pp. 133-151, and RICHARD GASKIN, *The Sea Battle and the Master Argument: Aristotle and Diodorus Cronus on the Metaphysics of the Future*, Berlin, New York, De Gruyter, 1995.

TEXT 7

It is clear that among the things there is what is not necessary in existence and in non-existence, for in fact it is evident and commonly accepted that many of the things do not have a necessary existence. I do not mean as long as [a thing] exists and on the condition that it exists. Insofar as [it fulfills] this condition and the other similar conditions which you will learn elsewhere among the conditions of the possible (so that its state changes to necessity), then the thing is necessary by virtue of them. Rather, its existence alone is not necessary if you consider its quiddity *without* adding any condition. Indeed, the ascertainment of the condition and its removal are not the same; and it is not the same for you to say, “Zayd necessarily walks”, and “Zayd necessarily walks as long as he walks.”³⁴

Avicenna explains that what is necessary *per aliud* remains necessary only as long as the predication exists. For instance, Zayd walks necessarily only for as long as he is walking. This allows Avicenna to argue that the necessity of the present does not entail determinism, aligning his position with Aristotle’s text – specifically with the first point of Aristotle’s solution, as discussed earlier.

When it comes to conditional necessity, another condition might involve the occurrence of a cause. For example, when wood comes into contact with fire, its combustion becomes necessary:

TEXT 8

Similarly, when you consider burning and wood, you find that burning does not belong to the wood necessarily, but when the condition of being burnt, or the condition of being in contact with a fire, has been set [for the wood], in the time frame in which [fire] has an effect on such a thing, [burning] becomes necessary³⁵.

The same principle applies to propositions. Avicenna writes:

TEXT 9

Just as it is necessary for something to be as long as it exists, and not to be as long as it does not exist, similarly it is not necessary for the statement to

³⁴ IBN SĪNĀ, *Kitāb al-Šifāʾ*, *Al-Manṭiq*, *Al-ʿIbāra*, cit., 74.7-15.

³⁵ IBN SĪNĀ, *Kitāb al-Šifāʾ*, *Al-Manṭiq*, *Al-ʿIbāra*, cit., 74.15-17.

be true if it is said absolutely. For example, if Zayd exists, then it is true to say, "Zayd exists as long as he exists." Likewise, the statement that is not actually true: "Zayd does not exist", becomes true when it is said: "Zayd does not exist as long as he does not exist."³⁶

Aristotle's Third Part of the Solution and Avicenna's Summary

In summarizing the content of this chapter, Avicenna reminds us that in singular propositions with a future-tense verb, truth is not determined by necessity but rather by possibility.

Aristotle's Solution (<i>De Interpretatione</i> , 19a32-19b4)	Avicennan Summary (' <i>Ibāra</i> , 75.10-13)
<i>[(1)] So, since sentences are true in the same way as the objects, evidently, in the case of those which are in such a condition as to be or come to be however it chances and admit the contrary states, the contradictory pair will necessarily be in the same condition.</i>	<i>[Your understanding] brings together all that has been said, [(1)] that in these propositions, truth is not determined by virtue of necessity, but rather by virtue of possibility;</i>
<i>This happens with [(3)] those which not always 'are' or not always 'are not': for it is necessary that one of the two members of a contradictory pair concerning these [sc. states of affairs which not always 'are' or not always 'are not'] should be true or false, but it is not necessary that this one or this one should be true or false, but it is however it chances, and [(2)] it is necessary that one of the two should be more true, but not already true or false. Hence, clearly, it is not necessary that of every affirmation and denial that are opposed one should be true and the other false. [(3)] For with what is things work out differently than with what is not but can be as well as not be – with these it is as we have said.</i>	<i>[(2)] that, in some of them, one of the two extremes is more worthy for the purposes of truth; [(3)] as well as [the fact] that some things are not necessary in their being and in their non-being. In spite of this, their being is primary to their non-being, as [proved by] the arising of something external [leading] to its corruption in most things.</i>

Table 1

³⁶ IBN SĪNĀ, *Kitāb al-Šifā'*, *Al-Manṭiq*, *Al-'Ibāra*, cit., 75.4-8.

It seems that, in his summary – albeit in a highly condensed form – Avicenna is echoing the final lines of *De Interpretatione* 9. More specifically, in his first point, Avicenna appears to extract only the primacy of possibility from Aristotle's opening lines, which, in this case, aligns with a realist interpretation of future contingents, as we will see shortly. In the second point, Avicenna closely mirrors one of Aristotle's statements. The third point may contain a subtle reference to negative states of affairs, but the text is somewhat unclear.

The final section of Avicenna's third point can be interpreted as follows: "In spite of this (i.e., that some things are not necessary in their being or non-being, hence contingent), their being is primary to their non-being, as demonstrated by the arising of an external factor (a clear reference to causality) that leads to their corruption in most cases." This implies that existence is more fundamental than non-existence, as the cessation or corruption of contingent beings depends on the intervention of an external cause. Avicenna further develops the idea of the primacy of being over non-being at the end of *Ilāhiyyāt*³⁷ I.5, where he states: «Existence is better known than non-existence, for existence is known in itself, while non-existence is known, in a certain way, through existence».

In any case, it is certain that here, at the end of the chapter, Avicenna does not address equimodality. Instead, he offers conclusions that represent a significant innovation compared to Aristotle's original text, or at least compared to the standard interpretation of it.

³⁷ *Ilāhiyyāt* (Metaphysics) constitutes the final section of Avicenna's philosophical summa, the *Kitāb al-Shifā'* (Book of Healing). It follows the sections on logic, natural sciences, and mathematics, and thus can be regarded as the culmination of his philosophical system. Within this structure, logic functions both as a science and as the foundational tool that governs all subsequent sciences by establishing the principles of correct reasoning and demonstration. In contrast, *Ilāhiyyāt* delves into the foundational questions of existence (*wujūd*), essence (*māhiyya*), causation, and the Necessary Existent (*wājib al-wujūd*), situating these inquiries at the pinnacle of intellectual inquiry. By situating metaphysics after logic, Avicenna underscores the hierarchical nature of the sciences, where metaphysics builds upon the epistemic groundwork laid by logical principles, aiming to uncover the fundamental truths about reality and its causes.

Let us now examine the first point: «In these propositions, truth is not determined by virtue of necessity, but rather by virtue of possibility» (see: TABLE 1). Why is this the case? This depends on three factors: (1) how Avicenna defines singular propositions with a future-tense verb, (2) how he addresses them throughout the rest of the chapter, and (3) the relationship he establishes between possibility and the future.

To understand the connection between possibility and the future, we must turn to the fourth chapter of the second treatise of *al-'Ibāra*, where Avicenna writes:

TEXT 10

After that³⁸, specialists established another convention among themselves, and gave the signification of: “possible” a meaning [even] more specialized than this, namely, that its status, at the moment someone pronounces it, is nonexistent; but in the future it is not necessary that it exists or [that] it does not exist³⁹.

The third type of possibility, namely “future possibility”, thus takes the form of the negation of future necessity.

Let us now turn to the logical section of the *Najāt*⁴⁰:

[As for] future possible (*mumkin*) predication, well the truth and falsity [of the proposition] is not determined for either side of the opposition, even though it must be one or the other. [An example is] your statement, ‘Zayd will walk’ and ‘Zayd will not walk.’ If it were the case that one of these two were true at this time and the other false due to the statements themselves one of the two things will come to be and the other fail to be by necessity. Thus, the matter will be necessary (*wājib*), not possible, and choice (*ikhtiyār*) and the

³⁸ After dealing with one-sided and two-sided possibility (contingency).

³⁹ IBN SĪNĀ, *Kitāb al-Šifā'*, *Al-Manṭiq*, *Al-'Ibāra*, cit., 117.16-18.

⁴⁰ It is a compendium of the essential parts of the *Book of Healing*. According to Gutas' reconstruction, Avicenna wrote *The Salvation* or *The Deliverance* (*al-Najāt*) shortly after completing the final books of the *Book of Healing*, around 1026-27. See: DIMITRI GUTAS, *Avicenna and the Aristotelian Tradition*, cit., p. 115.

preparedness (*isti' dād*) [of potentialities for actualization] will no longer exist. [Thus] the nature of the possible will be entirely nullified⁴¹.

In a subsequent passage, we read:

For truth is [determined] by correspondence and, [in the case of universal Necessity propositions,] this correspondence is realized only for something whose persistence is necessary. We do not judge propositions whose predicate is possible and whose time reference is the future to be true or false for as long as they neither correspond to existence nor fail to do so⁴².

We can now identify the defining features of Avicenna's approach to future contingents:

1. Its logical and semantic focus. While there is significant exegetical continuity between Fārābī and his late antique predecessors⁴³, particularly in the way Fārābī extends Aristotle's deterministic arguments in his commentary on *De Interpretatione* and addresses theological questions related to divine knowledge and theodicy, delving also into moral questions, Avicenna stands out for his notable independence of thought. Although he acknowledges the value of tradition, he adopts a reformist approach, offering a reworking grounded both in Aristotle's text and in his own reflections. As we saw in *Ibāra* I.10, Avicenna disregards theological and moral arguments, instead emphasizing the logical dimensions of Aristotle's work, albeit with references to metaphysics.
2. An emphasis on modalities and the nuanced concept of possibility, especially in relation to necessity, as seen in the distinction between something considered absolutely and under a condition.

⁴¹ *Avicenna's Deliverance: Logic*, translated by Asad Q. Ahmed, Karachi, Oxford University Press, 2011, p. 20.

⁴² *Avicenna's Deliverance: Logic*, cit., p. 36.

⁴³ For example, Iamblichus, Ammonius, Stephanus, Boethius. See: GINEVRA TOZZI, *Future Contingents in Arabic Logic*, cit.

3. This leads directly to the final point: the validity of the Principle of Bivalence, supported by the realist approach.

In order to develop a comprehensive understanding of this third point, it is essential to consider the following four aspects:

1. Avicenna's definition of truth in *Ibāra* I.10, where truth is defined as «that which corresponds to existence»;
2. The fact that future contingents, by definition, describe states of affairs that do not yet exist;
3. Their indeterminacy regarding truth values, meaning that either truth value is possible for each disjunct;
4. The relationship Avicenna establishes between possibility and the future.

Building on this, and on the way Avicenna described propositions in the past and present tenses, we can assert that his approach delineates a distinction between propositions that are “necessarily true”, pertaining to the past and present, and those that are “possibly true.” The latter clearly correspond to future contingents, where possibility – as previously noted – is defined as the negation of future necessity⁴⁴. In sum, Avicenna's interpretation diverges from traditional readings by employing this modal principle to affirm the universal validity of the Principle of Bivalence.

Abstract This paper examines Avicenna's reworking of Aristotle's *De Interpretatione* 9, focusing on the treatment of future contingents in *al-'Ibāra* (Interpretation), the

⁴⁴ In this framework, asserting that a singular contingent proposition with a future-tense verb is “possibly true” amounts to claiming that *P* is either true or false, excluding any other possibility. By doing so, Avicenna broadens the scope of the modal operator while simultaneously defining possibility as the negation of future necessity. This allows him to preserve and defend the concept of contingency and uphold the Principle of Bivalence, focusing on the intrinsic modal properties of singular future-tense propositions.

third part of the Logic section of his *Kitāb al-Shifā'* (Book of Healing). Through a comparative analysis, it highlights how Avicenna integrates Aristotelian principles with his own metaphysical framework, emphasizing essence (*māhiyya*), existence (*wujūd*), and causation. Avicenna challenges the deterministic implications of Aristotle's arguments by grounding the indeterminacy of future contingents in the modal relationship between possibility and necessity. His notion of conditional necessity ties the truth of future-tense propositions to the realization of causal conditions, offering a realist solution to the problem of future contingents. The study reveals Avicenna's delicate balance between continuity and innovation in medieval Islamic philosophy, particularly his redefinition of possibility as the negation of future necessity.

Riassunto Questo articolo prende in esame la rielaborazione avicenniana del nono capitolo del *De Interpretatione* di Aristotele, e si concentra sul trattamento dei futuri contingenti in *al-'Ibāra* (Interpretazione), che costituisce la terza parte della sezione Logica del *Kitāb al-Shifā'* (Libro della Guarigione). Attraverso un'analisi comparativa, il lavoro mette in evidenza come Avicenna integri i principi aristotelici all'interno di un quadro metafisico originale, che si regge sui concetti di essenza (*māhiyya*), esistenza (*wujūd*) e causalità. Avicenna supera le implicazioni deterministiche degli argomenti di Aristotele radicando l'indeterminatezza dei futuri contingenti nella relazione modale tra possibilità e necessità. La sua nozione di necessità condizionale lega la verità delle proposizioni al futuro alla realizzazione di condizioni causali, offrendo una soluzione realista al problema dei futuri contingenti. Lo studio rivela il delicato equilibrio di Avicenna tra continuità e innovazione nella filosofia islamica medievale, in particolare attraverso la ridefinizione della possibilità come negazione della necessità futura.