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SIMILARITIES AND DIFFERENCES IN THE LOGIC OF ARISTOTLE AND AVICENNA

Abstract: This article analyzes some similarities and differences in the logic of Aristotle and Avicenna. A brief analysis of the logical teachings of Aristotle and Avicenna shows that the main differences in the views of Aristotle and Avicenna are found only in determining the logic and range of problems that constitute the subject of this science.

In his solution of this question, Avicenna was at the side of the Neo-Platonists and showed irrefutable evidence in support of their view that logic is both a part of philosophy and an instrument of science. Whereas, according to Avicenna, the meaning of logic as part of philosophy is to study the forms of thinking, its value as an organon is that, permeating all sciences as an organon, it connects and unites them into one single system.

Avicenna also developed, more thoroughly than Aristotle, a theory of proposition, which includes the doctrines of both categorical and conditional propositions and conditional syllogisms.

Key words: ancient Greek philosophy, medieval philosophy, logic, theory of proposition, syllogistics.

Avicenna's logical thinking, much like other Arabic/Farsi-speaking philosophers, was preceded by the logical doctrine of ancient philosophers, among whom the unchallenged authority remained Aristotle (384 - 322 BC), the greatest representative of ancient Greek philosophy.

In our opinion, Aristotle's greatest contribution to mankind lies precisely in the fact that he was the first among the ancient philosophers who organized and systematized logic as an organon of all philosophical sciences. The logical teachings of the first teacher and numerous comments to them for many centuries

served as – if not the only one, then certainly the main–source of information on logic.

Among the philosophical works of Aristotle, Six logical treatises have special significance for the study and analysis of his logical doctrines, namely: 1) "Categories", 2) "On Interpretation", 3) "First Analytics", 4) "Second Analytics", 5) "Topics" and 6) "Sophistical Refutations". Those six treatises, together with the later Byzantine logics, were combined under the general name "Organon." [4, c.280].

In addition to the Organon, some issues in logic, including the law of identity, the law of non-contradiction, the law of the excluded middle and related laws of correct thinking, etc., are set forth in Aristotle's other major work, Metaphysics.

Therefore, the main theoretical sources of Arabic-language logic, founded by Abunasr al-Farabi (870-950), should be sought in Aristotle's indicated logical legacy. Farabi commented on the whole Aristotelian "Organon" and his "Metaphysics" and called the Greek thinker his "first teacher" and spiritual mentor in the field of logic. Among Muslim Peripatetic philosophers, Farabi himself is considered the second spiritual mentor – a teacher–after Aristotle.

I should note that many scientists studied the logical teachings of Aristotle, such as: Jan Lukasevich, Akhmanova, Vladimir Markin, Boger George, Barnes Jonathan, Smiley Timothy and many others. Also, there are many studies devoted to the logical teachings of Avicenna, such as the monographs of M.Boltaev, M.Dinorshoev, N.Saifullayev, A.V.Smirnov, Street Tony, Rescher Nicholas, Kamran I. Karimullah and others.

In this article I try to analyze and compare the theory of propositions and syllogism of Aristotle and Avicenna and show some of their differences. The comparative analysis that I carried out showed that in some issues and positions Avicenna's position agrees with Aristotle's. But, in some issues, Avicenna's position about propositions and syllogisms, their types and their interpretation differs from Aristotle's position.

I concluded through the comparison of the teachings of Aristotle and Avicenna on propositions and on syllogisms, that of course, Aristotle and Avicenna – both thinkers made significant contributions to the development of logic, in general, and the development of proposition and syllogistics, in particular. It should be also noted, that Aristotle's logic had a great influence on the philosophical and logical views of Avicenna.

The analysis also showed that Avicenna is not a simple follower or imitator of the teachings of Aristotle. So, in his writings, Avicenna repeatedly states in clear and precise form that in logic and philosophy he is not only a blind imitator of Aristotle and a fanatical defender of his teachings. As a result of independent creative research and, of course, proceeding from the indisputable positions of his predecessors, Avicenna created his own unique logical system in the period of the Middle Ages. He made many adjustments to the logic of Aristotle, enriching and passing it on to future generations. Especially Avicenna's merit in the development of the theory of conditional propositions and conditional (hypothetical) syllogisms is great.

With some logical works of Aristotle, such as for example "Categories", Avicenna was familiar since his youth when his mentor in philosophy and logic Abu Abdullah al-Natali introduced him to "The Sorcerer" Porphyry, where the latter commented on "Categories" Stagirite's "Categories" from the standpoint of realism.

Some of Aristotle's works and commentaries on them, translated into Arabic on the basis of calibrated Syrian translations, were hard to reach for the young Avicenna. Moreover, the commentators of Aristotle often, either intentionally or by mistake, distorted the meaning and the purpose of his logical teaching. For example, such a hard-to-access and distorted writing was for the discerning young Avicenna the Arabic translation of Aristotle's *Metaphysics*. Judging by the recollections of Avicenna himself, in his youth he read this book 40 times and knew it by heart, but could not understand the author's idea. The main ideas of "Metaphysics", and afterwards the content of other logical works of Aristotle

revealed themselves to Avicenna only after he accidentally bought Al-Farabi's book "The Goals of Metaphysics" in the bazaar [1,158-160].

Thus, through the study of Farabi's commentaries on the Aristotelian heritage, Avicenna found the right way to understand the logical teachings, precepts and goals of the First Teacher. But of course, Avicenna did not confine himself to studying the logical and, more generally, philosophical heritage of Aristotle: he was also well aware of the logical theories of the Peripatetics, Neo-Platonists and other schools of ancient Greek philosophy.

At this point it should be noted that, in addition to Aristotle's ideas, Avicenna also developed and incorporated into his logical system the most rational and progressive ideas of other ancient Greek thinkers and sages. The researchers of the philosophical heritage of Avicenna agree that he dealt creatively with the resolution of problems of logic. For the sake of justice, we must admit that Avicenna is the author of one of the perfect logical systems of the Middle Ages. However, to confirm this statement, a separate study would be required. Below, based on a comparative analysis of the Aristotelian and Avicennian logical systems, we point out some of their differences.

First, we consider the differences which exist in the views of both thinkers on the subject of logic. For Aristotle, logic was an art that contributed to the ability to think and judge correctly. He singled out logic as an independent discipline and prefixed it as an "organon" to the study of material things. At the same time, in his opinion, the organon is not part of philosophy itself, but only a propaedeutic to it. He did not define this science and did not include it in his classification of sciences. The subject of Aristotle's organon was categories, propositions, inferences and scientific evidence.

In his solution of this question, Avicenna was at the side of the Neo-Platonists and showed potent evidence in support of their view that logic is simultaneously a part of philosophy and an instrument of science. Whereas, according to Avicenna, the meaning of logic as part of philosophy is to study the

forms of thinking, its value as an organon is that, permeating all sciences as an organon, it connects and unites them into one single system.

Logic is the initial element of the philosophical system of Avicenna because it is the organon of scientific knowledge, and everyone who chooses the thorny path of science must first know this organon, i.e. the logical means and methods of achieving true knowledge, the ways and means of distinguishing truth from falsity, the means of avoiding mistakes and errors. But, as M.Dinorshoev indicates, "logic, according to Avicenna, is an organon of not just any, but only deductive knowledge" [1,72-75]. Avicenna's neutrality manifests itself already when he defines logic as a philosophical science with its separate subject of study. In this regard, Avicenna emphasizes that logic is absolute and self-contained as a science but relative and subordinate as an organon. Thus, Avicenna in contrast to Aristotle, who believed that the science he had created was a doctrine of how to build a syllogism and, in particular, proof, Avicenna defined logic as a science in which the ways of transition from concepts existing in the human mind to concepts which he would like to acquire, about the state of these concepts; about the number of species, the order of transition from one concept to another, about their forms being correct, and species that are not such. [7,177-178].

Thus, Avicenna in his definition of logic did not limit its subject to syllogistics but rather contended that "the logician must know the principles of proposition and the ways of its construction, whether by definition or otherwise, the principles of proof and the ways of its construction, whether syllogisms or other. First of all, he must begin to understand the simple concepts from which the proposition and syllogism are constructed "[7,87]. Proceeding from this, the logical system of Avicenna, unlike Aristotle's system, begins with a clarification on the nature of the concept as the most important element of proposition and syllogism.

Also in the spirit of Aristotle, Avicenna outlined the rules of definition and error, as well as the ways they can be violated. These rules are:

- 1) the definition should not contain a vicious circle, for example: "Time is the time limit";

2) the definition should not contain a notion known to the same extent as the one defined, for example: "Black is such a color that is opposite to whiteness";

3) the definition should not be provided in terms of an even less known concept, for example: "Fire is a body that looks like a soul";

4) the definition should not be provided in terms of a concept that is defined in terms of the definiendum, for example: "The sun is a star that rises in the day time".

Also more thoroughly than Aristotle, Avicenna developed a theory of proposition, which includes his doctrines of both categorical and conditional proposition. We will expound the crucial points of his teaching in comparison with Aristotle's theory of proposition.

Like Aristotle, Avicenna believed that proposition is a statement that affirms or denies something about something. Avicenna also like Aristotle believed that the proposition is true if it corresponds to being, and it is false if it does not correspond to it. Both thinkers were well aware that not every sentence can be proposition.

In spite of these commonalities between the thinkers, Aristotle's theory of proposition is only a theory of simple categorical proposition, as from his point of view the conditional propositions are not, strictly speaking, apophatic speech, i.e. not propositions in the proper sense, since they definitely do not express the inherent nature of anything. Avicenna's view on this issue is different. The main difference between the Avicenna's and Aristotle's theory of proposition is that Avicenna's teaching is a teaching not only about categorical, but also about hypothetical (conditional) proposition. Avicenna distinguishes between conditionally connective (conjunctive) and conditionally dividing (disjunctive) propositions. Avicenna writes: "These propositions are formed from two statements, each of which has lost the properties of proposition and the connection between them ... such that one of them is conditioned from the other and follows from it. Such propositions are called conditionally-connective (conjunctive) proposition. The relationship between the statements is such that one of them is

contrary to the other and different from it. Such propositions are called conditionally dividing (disjunctive) proposition.

It should be noted, that this question firstly was developed by the Stoics. The question is, was Avicenna influenced by the Stoic logical teachings? The fact is that the works of the Stoics were not translated into Arabic and Persian at the time of Avicenna. Considering these types of conditional proposition, Avicenna does not write anywhere that these types of propositions were developed before him. Therefore, he mentions other logic problems investigated by his predecessors in his logical studies. In all likelihood, being ignorant of the logical research of the Stoics, Avicenna developed his own doctrine on conditional proposition" independently. The same opinion is supported by famous scientists such as: Muso Dinorshoev, Nigmatullo Sayfullaev, Rescher and others.

Shehaby concludes his overview of Avicenna's hypothetical syllogisms on a false note:

Though there is much to say against Avicenna's ideas on the subject of conditional propositions and syllogism, there is no doubt as to their historical significance. The vivid picture which the text reveals of the Peripatetic doctrines in addition to many of the Galenic views will be of much interest to the historian of late Greek logic. The most important aspect of this picture is perhaps the role which the Peripatetics played in diverting the attention of philosophers from the worthy step which Stoic thinkers had taken. The Peripatetic influence is clear in Avicenna's case.[5]

It seems that Shehaby's disappointment originates with the expectation – mercifully unrealized – that we find in Avicenna's hypothetical syllogistic Stoic – like “antecedents” to modern propositional logic as “discovered” by Łukasiewicz and Mates a generation before. Avicenna's Peripateticism appears, in Shehaby's eyes to be nothing but a sterile diversion.[12,38-39].

Fritz Zimmermann seconds Shehaby's verdict:

In general, [Shehaby] has admirably avoided the temptation to exaggerate Avicenna's importance for ancient or modern logic. The result of his work is

primarily negative: in many respects, Avicenna's contribution is disappointing. If we want to deal justly with Arabic logic, then we must swallow this bitter pill (lit. "bite the sour apple") and work out Arabic logic's particular features, however slight they might actually be.[5]

I would also like to note that in many questions of syllogism, the opinions of Aristotle and Avicenna converge. This is primarily in relation to the definition of the syllogism. Both thinkers confirm that "Syllogism is a reasoning consisting of several propositions, from which a new proposition is necessary, follows. So, from the fact that "All men are mortal" and "Socrates is a man" follows, that "Socrates is mortal".

Second, their opinions converge on the figure of the syllogisms. Both Aristotle and Avicenna considered 3 figures of syllogisms. But this does not mean that they did not know the fourth figure. They knew about this figure, but due to the fact that this figure use very rarely and does not give a true conclusion always, they did not specifically consider it.

Those rules of parcels, which were considered by both Aristotle and Avicenna, correspond to modern logic. As for the rule of terms, Avicenna considered only one rule in difference to the three rules of modern logic. Considering this rule, Avicenna notes that only three terms should be involved in each syllogism.

Aristotle believed that the science created by him was a theory of how to build a syllogism, in particular, evidence. In the teaching of Aristotle about the syllogism, we are talking about three figures of syllogisms, each of which includes a certain number of modes. According to Aristotle, the most completed and flawless of them are the syllogisms of the first figure. In the first figure, the syllogisms have 5 acceptable or correct modes, in the second figure - 4, and in the third figure - 6. The main meaning of the syllogism is that in the syllogism two side terms (S and P) are connected by means of the connecting mean (M) which is common to both parcels.

Aristotle mainly investigates a simple categorical syllogism, although in the Second Analytics partially considers conditional syllogisms.

The Aristotelian theory of the syllogism consists of the doctrines of assertoric and apodictic syllogisms. Both kinds of inferences are formed through a combination of categorical propositions. Aristotle, in his classification of syllogisms, did not consider conditional conclusions, but concentrated all his attention on the study of necessary, reliable and categorical syllogisms.

In categorical syllogisms, the basic conditions for the truth of a conclusion according to Aristotle are the truth of parcels and the observance of the rules or axioms of syllogism. Violation of the rules of syllogism with reliable parcels also does not lead to truth.

Depending on the position of the middle term, Aristotle distinguishes three syllogism figures, although he implicitly considers the fourth figure.

It should be noted that the teachings of Aristotle, especially his syllogistic, had a great influence on the worldview of Avicenna, his greatest Muslim follower, who made a valuable contribution to the further improvement of the organon of science.

Avicenna defined the syllogism in the spirit of Aristotle, i.e. as “an utterance consisting of several propositions from which follows a new utterance, if included in it the propositions are correct”. But then, after a thorough analysis of syllogisms, he revealed and consolidated in his teaching new conditions for the formation and construction of syllogisms.

Avicenna, unlike Aristotle, considered **enthymeme** and **epiheiherme**. Similar to abbreviated syllogism, in which one of the constituent parts is missed, is called enthymeme. Most often, big parcels missed as the most easily implied and only a smaller parcel and conclusion is expressed. Sometimes small parcel is missed, but a big parcel and a conclusion is given. For example: “Avicenna is a philosopher, because he knows the alphabet of wisdom.”

Epiheierme – reasoning, consisting of several simple syllogisms, interconnected in such way, that the conclusion of the previous syllogism becomes the premise of the next.

In the epiheierme, both parcels are enthymemes. It consists of enthymemes. An example of an epiheierme can be the following reasoning: “A lie deserves contempt, because it is immoral. Flattery is a lie, as it is a deliberate perversion of truth. Flattery deserves contempt”.

Avicenna, unlike Aristotle, also considers repetitive syllogisms. The specificity of the repetitive syllogism, in contrast to the connective syllogism, according to Avicenna, lies in the fact that its conclusion is obviously and actually exists in one of its parcels. So, for example, they say:

If he has a fever, then he has a pulse.

However, he has a pulse.

Therefore, he has a fever.

Each repetitive syllogism consists of conditional and exclusive parcels. A repetitive parcel is either one of the elements of a conditional parcel (i.e. its antecedent or consequent), or its opposite, introduced use the “but”, “however” particles and representing a categorical syllogism.

In conclusion of his study of conditional syllogisms, Avicenna concluded that “however, it often happens that some parcels are omitted either for the sake of abbreviations or for the sake of tricks, or because of their obviousness and clarity. It often happens that they propose and post propose parcels, but in the end they come to the syllogisms we talked about.” [1,84].

For this reason, according to Avicenna, complex syllogism is of two types: (1) complex continuous syllogism, (2) complex discontinuous syllogism.

A complex continuous syllogism is a syllogism, in which the conclusions of the preceding syllogism are marked in its place and are established according to how they manifest themselves in subsequent syllogisms. Example:

1. Every A is B

Every B is C

Every A is C

2. Every A is C

Every C is D

Every A is D

3. Every A is D

Every D is E

Every A is E

A complex discontinuous syllogism is a syllogism in which the conclusions of the preceding syllogisms are not given in their place. On the contrary, they are omitted and are not repeated in the parcels of the subsequent syllogism. Example:

Every A is B

Every B is C

Every C is D

Every A is D

In the above example, the conclusion of the preceding syllogism “A is E” is not shown in its place and is not repeated in the parcel of the previous syllogism.

Avicenna, in contrast to Aristotle, also considered the contradiction syllogism (qiyas al-khulf). Among the complex syllogisms Avicenna emphasizes the contradiction syllogism. According to Avicenna the differences between contradiction syllogism and other complex syllogisms is that the contradiction syllogism proves the falsity of its opposite thesis by reducing it to absurdity.

Along with the syllogism, Avicenna considers induction (istiqra) and analogy (tamthil) as forms of evidence. But he is sure that induction and

analogy compared with syllogism are weaker forms of acquiring reliable knowledge. An analysis of these forms of evidence confirms his rightness.

These were some similarities and differences in the logic of Aristotle and Avicenna, which I showed briefly in this article. I analyzed and showed these questions more widely in my monographs “Comparative analysis of the theory of proposition of Aristotle and Avicenna. Dushanbe, 2015” and “Comparative analysis of the syllogistic of Aristotle and Avicenna. Dushanbe, 2017.” In Russian language.

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