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AVICENNA III. LOGIC
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iii. Logic

*Avicenna's works on logic*. Many of Avicenna's works on logic are extant and most of them have been published. With the exception of two Persian works, *Dāneš-nāma-ye ʿalāʾī* and *Andar dāneš-e rag* (see below, xi), all of his works are written in Arabic.

The nine parts that make up the first treatise of *Ketāb al-šefāʿ* (Book of the healing [of the soul]), Avicenna's philosophical summa, are devoted to logical matters. The first of these parts, the *Madḵal*, is an introduction to the other eight, each of which corresponds to one of the Aristotelian logical works, collectively known as the *Organon* or "instrument of science." The *Madḵal*, on the other hand, corresponds to Porphyry's *Isagoge*, a work that strongly influenced the writings of Islamic logicians as well as those of medieval Latin logicians. In addition to these works, the first part of Avicenna's *Ešārāt* as well as the first part of the *Najāt* are summaries of Avicenna's version of Aristotelian logic.

The last work that Avicenna wrote on the subject of logic, which like the *Najāt* and the *Ešārāt* is a summary of his logic, is called *Manṭeq al-Mašreqīyīn*. It is the only extant portion of a philosophical encyclopedia he reportedly wrote or meant to write.

*Avicenna on the subject matter of logic*. Avicenna's works on logic usually begin with a discourse on the utility and the subject matter of logic. Logic for him is an instrument (*āla*) that has numerous functions. Thus in the *Najāt* (p. 3) which is an abridgement of the *Šefāʾ*, he writes: "I start with a detailed description of the art of logic because it is the instrument which prevents the mind from committing errors both in conception (*taṣawwor*) and in judgment (*taṣdīq*). It is the instrument that leads to true beliefs as well as to the reasons for and the right way to achieve them." By the "right way" Avicenna is referring to the methods by which one can teach a proper definition, as well as to the mastering of the theory of the syllogism and other methods which guard the mind against committing errors in judgment, i.e., in composing propositions. Knowing how to define leads to conceptual soundness, whereas knowing the methods that lead from the known to the unknown guarantees that one makes sound judgments. That which leads to a clear and definite conception (*taṣawwor mostaḥṣal* is the expository statement (*qawl šāreḥ*) which can be either an essential definition (*ḥadd*) or a descriptive definition (*rasm*). That which leads to a definite judgment (*taṣdīq yostaḥṣal*) is an argument (*ḥojja*) which can be either a syllogism (*qīās*), an induction (*esteqrāʾ*), or an analogy (*tamṯīl* ) (*Ešārāt*, pp. 181-85; *Manṭeq*, p. 10). According to Avicenna the latter can help identify not only what is true and valid, but also what is false and invalid (*Manṭeq*, pp. 5-6). Moreover, these methods are a necessary condition not only for scientific or theoretical inquiry, but also for the "salvation of man," which, according to Avicenna, lies in the purity of man's soul (*Treatise*, p. 14): "This purity of the soul is attainable by contemplating the pure form and avoiding this-worldly inclinations. And the way to these two is science. And no science which can not be examined by the balance of logic is certain and exact." This statement indicates that mastering the science of logic is, in Avicenna's view, a necessary condition for the knowledge of any discipline, be it theoretical or practical. In either case the purpose is knowledge: knowledge of the truth (*ḥaqq*) in the former case and of the good (*ḵayr*) in the latter (*Madḵal*, p. 149).

This raises a question concerning Avicenna's views on the age-old debate about whether logic is a part or an instrument of philosophy. Avicenna argues (*Qīās*, p. 10) that there is no contradiction (*tanāqoż*) between those who maintain that logic is part of philosophy (i.e., the Stoics) and those who hold that logic is an introduction to and a tool for philosophy (i.e., the Peripatetics). The answer to this question depends, according to him, on one's definition and understanding of the subject matter of philosophy, and any quarrel about this

issue is both meaningless (*bāṭel*) and futile (*fożūl*) (*Madḵal*, p. l6).

As for the subject matter of logic, Avicenna maintains that the secondary intelligibles (or concepts) (*al-maʿānī al-maʿqūla al-ṯānīa*) are the proper subject matter of logic (*Elāhīyāt* I, p. 10).

These secondary concepts depend on the primary concepts, Avicenna argues. By this he means that the former come about by abstraction (*tajrīd*) from the latter, i.e., they become ideas remote from the particular content which they have as primary concepts. The secondary concepts, in other words, are remote from the sensible forms (*hayʾāt maḥsūsa*) or from the particular material objects (*ʿEbāra*, p. 2, line 1). The primary concepts, on the other hand, are associated with the sensible material objects of which they are pictures (*ṣowar*) (ibid., p. 1, line 1).

*Logic and language*. The distinction between primary and secondary intelligibles occurs in several Arabic logical texts much before Avicenna's time. As many scholars have already pointed out, it occurs in (the Arabic translation) of Porphyry's *Isagoge* as well as in the writings of Fārābī and other Arab thinkers of the tenth and eleventh centuries. Yet, probably due to historical circumstances, it is Avicenna who is credited as the originator of this distinction, which remained a central issue in logical debate for several centuries.

This distinction, to which the modern distinction between object language and metalanguage is related, is of great importance for logicians. First it defines as the subject matter of logic those concepts which, in Avicenna's language, "have a mental existence that is not attached to matter at all or is attached to non-corporeal matter" (*Elāhīyāt*, p. 11). These are the secondary concepts and not the primary concepts. The latter, because they are descriptions of the accidental aspects of things, can not be the subject matter of logic.

Secondly, this distinction is an extension and a development of the Aristotelian theme concerning the three modes of discourse—written, spoken, and mental. Avicenna discusses these in the first chapter of his *ʿEbāra* under the section heading: "On the Relationship Between Things (*omūr*), Conceptions (*taṣawworāt*), Spoken Utterances (*alfāẓ*), and the Written [Form]," thus making the threefold Aristotelian division a fourfold division by adding the dimension of external things. Avicenna describes the relationships between the four modes as follows (paraphrased):

Due to a special faculty with which mankind is equipped (*qowwa ḥessīya*) external things are imprinted (*tartasem*) in the mind (*nafs*, soul). These imprints are present in the mind without the presence of the material object which they depict; this is the stage of abstraction (*tajrīd*). Thus, things have two modes of existence: an external existence (*wojūd fi'l-aʿyān*), i.e., the individual material objects, and a mental existence (*wojūd fi'l-nafs*). The argument then describes the need for a tool to communicate, thus adding the third dimension (spoken). The fourth dimension (the written word) is explained through the need for continuity of ideas (*ʿEbāra*, pp. 1-2). The third dimension (speech) and its relation to thought (the second mode) is a major theme in many of the logical writings of medieval philosophers, both Arab and Latin, many of whom claim that logicians are supposed to deal with utterances insofar as they signify thought.

According to Avicenna, however, language should on no account be considered an issue for logicians in their logical inquiries. Logicians, he says (*ʿEbāra*, p. 5) are concerned with utterances (*lafẓ*) only accidentally (*be'l-ʿaraż*) and only insofar as these utterances signify the concepts themselves (*al-maʿānī anfosohā*), which are the proper subject matter of logic. Elsewhere, (*Madḵal*, p. 22) Avicenna says that logicians need (natural) languages only in order to be able to address logical issues and to communicate with others about these issues. Logic, according to him, does not deal with utterances per se because these are only a tool and can theoretically be replaced by some other device (*ḥīla*) through which one can express logical relations without the mediation of a natural language. Avicenna criticizes those who think of language as an integral part of logic. By this he refers to the logicians of the tenth century (led by Fārābī) who adopted this view.

Yet, in the same passage of his *Madḵal*, Avicenna states that "utterances have various modes (*aḥwāl*) on account of which the modes of the notions corresponding to them in the soul vary so as to acquire qualifications (*aḥkām*) which would not have existed without the utterances." From this statement, it is easy to infer—as has A. I. Sabra, for example (p. 763)—that "the secondary concepts, the proper object of logic, not only are reflected in language, but are generated by it." How can we reconcile these two positions of Avicenna concerning the thought-language relationship?

In the *Ešārāt* (p. 181) Avicenna modifies his initial position concerning the accidental nature of the relationship between logic and language by stating that languages have a universal side (*jāneb moṭlaq*) which is not confined to

any particular language. It is this universal side of language with which logicians should be concerned. Unfortunately, Avicenna does not explain what counts as a universal feature of a language.

Whether in the final analysis utterances are a subject for logical inquiry or not, however, Avicenna devotes much of his logical theory to the relationship between language and thought or logic.

Utterances can signify either a universal notion (“man” or “animal”, each of which is predicated of many individuals) or a particular one (“Zayd”, i.e., a particular man). Like all the logicians, he adopts the Porphyrian division of general terms into the following categories: genus (*jens*), differentia (*faṣl*), species (*nawʿ*), property (*ḵāṣṣa*), and accident (*ʿaraż ʿāmm*).

The list of five predicables, as these are called, is the subject matter of logic for it includes all the secondary concepts (or, to be more exact, the terms that signify these concepts).

Utterances, Avicenna says (*Ešārāt*, p. 187; *Manṭeq*, p. 14) can signify concepts in three different ways:

(1) By correspondence (*moṭābaqa*), i.e., when a certain term directly signifies the concept for which it was coined or designed (*mawżūʿ*), as in the term “triangle” which signifies the notion of a three-sided figure or “man” which signifies the notion of a rational animal.

(2) By inclusion (*tażammon*), i.e., when a concept is included in the meaning of a term. “Man”, for example, means and corresponds to the notion “rational animal”. Thus both “rational” and “animal” are included in the meaning of “man”.

(3) By implication (*eltezām*), i.e., when the meaning is only implied by the term (it neither corresponds to it nor is it part of its meaning), as in the relationship between the term “ceiling” and the concept of wall (*Madḵal*, p. 43; *ʿEbāra*, p. 3).

Having dealt with individual terms, Avicenna next discusses how these terms combine to produce sentences. Like all logicians, however, his concern is not with the syntactical features of sentences as such, but rather with the statements (*qażīya*, *qawl jāzem*) that these sentences represent.

A statement is either predicative (*ḥamlīya*) (“S is P”) or conditional (*šarṭīya*).

The latter is a combination of two or more predicative statements and can be either a conjunctive conditional (*šarṭī mottaṣel*) (if . . . , then . . .) or a disjunctive conditional (*šarṭī monfaṣel*) (either . . . or).

Avicenna's explanations of the different types of predicative statements, the division according to their quality, quantity and modality, and finally their different combinations in a syllogism are Aristotelian. His treatment of these same issues in relation to the conditionals relies heavily and perhaps exclusively on the Stoics who developed this branch of logic. Yet, Avicenna exhibits a superb understanding of these problems and presents them in a very coherent, systematic and clear style to the student of logic. His writings are, no doubt, the encyclopedia of Arabic logic.

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