A SECTION FROM THE LOGIC OF AVICENNA'S
DANISH NAMEH - E 'ALAI TEXT WITH TRANSLATION
ANALYSIS, AND NOTES: A CONTRIBUTION TO THE
HISTORY OF LOGIC

Dissertation for the Degree of Ph. D.
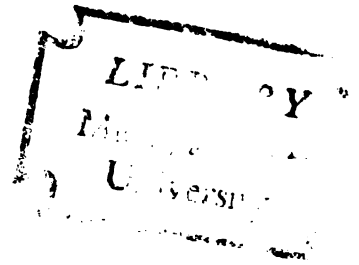MICHIGAN STATE UNIVERSITY
SANAULLAH KIRMANI
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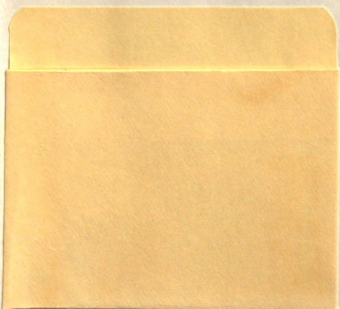
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Introduction to this study.

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translation which we have tried to keep as literal and . . .
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have wherever necessary, however, expanded the . . . .
of square brackets.

ABSTRACT

A SECTION FROM THE LOGIC OF
AVICENNA'S DĀNISH NĀMEH-E 'ALĀ'Ī TEXT
WITH TRANSLATION, ANALYSIS, AND NOTES:
A CONTRIBUTION TO THE HISTORY OF LOGIC

By

Sanaullah Kirmani

In this paper we present the text and translation with notes of the
logic section of Avicenna's Dānish Nāmeh-e 'Alā'ī.

The text, the entirety of which has been formulated but only a part
included and studied here, is the result of collating two manuscripts
that, to our knowledge, have never been collated before. The result
of the collation of our two manuscripts was intercollated both with
the Moin and Mishkat edition of the logic of Dānish Nāmeh and the
manuscript variations quoted in that edition. It is a part of the
text thus obtained that is presented in this study from page 24 to 92.
Our two manuscripts, the Moin and Mishkat edition, some problems re-
lating to the formulation of the text and its translation, as well
as some general and selected specific problems are discussed in the
Introduction to this study.

The Introduction is followed by the text which has been divided
into two sections and subdivided into chapters by the present author.

The text is followed by the Apparatus. This is followed by the
translation which we have tried to keep as literal as possible, in order
to preserve the flavor, with its terseness, of the original. We
have wherever necessary, however, expanded the translation by the use
of square brackets.

Sanaullah Kirmani

The notes which follow the translation deal mainly with substantive issues that arise either directly from the process of translation or from the positions which Avicenna seems to hold in the text under study.

We have, as far as possible, avoided making generalizations because what our subject needs most are philosophically critical textual studies.

A SECTION FROM THE LOGIC OF

AVICENNA'S D̄ANISH N̄AMEH-E 'AL̄AĪ TEXT

WITH TRANSLATION, ANALYSIS, AND NOTES:

A CONTRIBUTION TO THE HISTORY OF LOGIC

By

Sanaullah Kirmani

A DISSERTATION

Submitted to
Michigan State University
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for the degree of

DOCTOR OF PHILOSOPHY

Department of Philosophy

1974

G-92375

DEDICATION

With respect and fondness to the memory of my teachers

the late Harry Austryn Wolfson

and

the late Henry S. Leonard

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[SECTION II]

SYMBOLS

( ) = Omission; that the lemma enclosed is omitted in the manuscript.

[ ] = Addition; that the lemma enclosed is added in the manuscript.

] = Different reading; that the reading inside the half-bracket is
different in the manuscript.

⟨ ⟩ = Means the reading from the Moin and Mishkat manuscript named
within has been adopted.

⌐ = illegible.

| = end of a lemma.

|| = end of a line.

INTRODUCTION

AVICENNA

We are fortunate that Ibn-e Sina's autobiography, which he dicta-
ted to his pupil and constant companion, Juzjānī, as well as Juzjānī's
biographical continuation of it, has survived,[1] affording scholars
a glimpse into the diversified career of this famous Persian philo-
sopher.

Abū 'Alī al-Ḥossain bin 'Abdallāh ibn Ḥasan ibn 'Alī bin Sīnā
(known as Ibn-e Sīnā or Shaikh al-Raīs, and Latinized as Avicenna)
was born in Karmathain, near Bokhara, in A.D. 980. After a stormy
career as a philosopher, physician, and public administrator, he died
in Hamadan in A.D. 1037 at the age of fifty-seven.[2]

It is very difficult to separate Avicenna as a physician and
political man from Avicenna as a philosopher. This is not peculiar
to Avicenna; it is, rather, the case with Muslim philosophers of this
period in general, for although many a prince supported a philosopher,
philosophy was not a teaching vocation.[3] Having noted this general
difficulty we shall, however, summarize Avicenna's development as a
man of letters and a philosopher[4] without paying close attention to
his other activities.

Avicenna's education, characteristic of a Muslim youth, began
(presumably at home) with the study of the Quran and literature[5]

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(probably grammar[6]); and by the time he reached his tenth birthday, he had achieved such a mastery of these subjects that all were "struck full of amazement."[7] He was next sent to a greengrocer[8] from whom he learned Indian arithmetic. Meanwhile he was also taking lessons in Muslim jurisprudence and methods of religious (juridical) argumentation with Ismael Zahed.[9]

It is at this time, he tells us in his autobiography, that Abu 'Abdallah Nātilī,[10] proclaiming to be a philosopher arrived from Bokhara, was received by Avicenna's father and Avicenna placed under his tutelage.[11] With Nātilī he read the _Eisagoge_ of Porphry,[12] and five or six figures from the _Elements_ of Euclid, completing the rest by himself.[13] From this he moved on to Ptolemy's _Almagest_; but Nātilī, we are told, was not well versed in it, so, after the Introduction, Avicenna finished the work by himself and helped Nātilī understand it as well.[14] Having read the _Eisagoge_ with Nātilī, Avicenna by himself commenced a study of logic books and commentaries upon them until he had gained expertise in that subject.[15]

Unfortunately, we are told neither what books nor what commentaries these were. It would be useful to have this information, if only to determine what initial influences might have shaped his thoughts in logic. We surmise, though, that the "books" were most likely those of Aristotle and the "commentaries," commentaries upon these. Our surmise is not without foundation, for commenting on the progress of his studies, Avicenna names a particular Aristotelian work when he says that, having mastered logic, physics, and mathematics, "I returned to the science of theology (i.e., metaphysics) and engaged myself in the study of the book _Ta Meta ta Physica_."[16] This means that he had

probably already mastered that part of the Aristotelian corpus which traditionally precedes the _Metaphysica_. But the final determination of the titles and the sequence in which he read the Aristotelian corpus lies beyond the scope of this paper.

While Avicenna was in the midst of his study of the _Almagest_, Nātilī left for Gurgan. Hereafter, there is no mention of any other teacher under whom Avicenna studied.[17]

Avicenna continued his studies in texts and commentaries on the _Physics_ and the _Metaphysics_ but was soon attracted to medicine; he pursued that subject both in theory and practice and gained such a reputation in it that even accomplished physicians came to study with him. He was then, he reports, sixteen years old.[18]

Once again, at this age, he turned to logic and other parts of philosophy for another year and a half.[19] It is during this period that he had begun the study of Aristotle's _Metaphysica_. He despaired of ever understanding it, until perchance he came across Al-Farabi's commentary on it; which, finally, for him, proved to be the key to understanding this work.[20]

Finally, during this period, as a result of having participated in the cure of Nūh II bin Mansur (A.D. 976-977), the ruler of Bokhara, Avicenna was granted the use of the Samanīd royal library.[21] There he perused "the list of the books of the ancients"[22] and obtained those books that he desired. The library must have had rich holdings, for he says, "I obtained books whose very titles many have not heard of. [Books] that I too had neither seen before nor have seen with anyone since."[23] He completed his study of these by the time he reached his eighteenth birthday.[24]

This is all that he tells us of his initial formative years in philosophy. Undoubtedly he visited other libraries during his travels,[25] but no other libraries are mentioned either by him or by Juzjānī.

Historians have tried to establish intellectual connections between Avicenna and other philosophers.[26] They have also, from other sources, supplied us with a partial list of books read by Avicenna at the very early stages of his development.[27] However, such information is not supplied by the autobiography and its continuation by Juzjānī.

Juzjānī in his continuation of the autobiography includes a bibliography of Avicenna's works. He lists ninety-five works in all.[28] It is noteworthy that in this list only three are in Persian, the rest being in Arabic. Of these three in Persian, one only, Kitab-i 'Alai ('Alā'ī's Book), known also as Dānish Nāmeh-i 'Alāi (The Alai Book of Science) is on philosophical sciences. It is to Danish Nameh-i Alai that we now turn.

DĀNISH NĀMEH-I 'ALĀI

Dānish Nāmeh-i 'Alāī is also known by other titles. We have already mentioned Kitāb-i 'Alāī. It is also known as Hikmat-i 'Alāī (The 'Alāī Book of Philosophy), Dānish Māyah al-'Alāī (The 'Alāī Book of Principle Sciences), and Usool va Nikāt-i 'Uloom-i Khamsah Hikmiyyah (The Essentials and Subtleties of Five Philosophical Sciences). But the title by which it is most well-known is Dānish Nāmeh-i 'Alāī. Hereafter we shall refer to this book simply as Dānish Nāmeh.

The book was written in Isfahān,[29] and it is dedicated to 'Ala' al-Dawlah Abū Jāfar Muḥammad bin Dushmanziyār Kākuyiah (A.D. 1008-1051), the ruler of Isfahan, and Avicenna's protector and master.

In fact, as Avicenna himself tells us, the work was undertaken at the specific command of the king [30] hence, the word 'Alāī in the title.

The exact date of the composition of the work is not known. However, we do know[31] that Avicenna, who had served Shams al-Dawlah as prime minister in Hamadān, left Hamadān for Isfahān shortly after the accession of Shams al-Dawlah's son, Samā' al-Dawlah, in A.D. 1021. How soon after the accession Avicenna left we do not know.[32] We do know that Avicenna died in A.D. 1037, which means that the Dānish Nāmeh was composed ca. A.D. 1021-1037, which is ca. 412-428 of the Islamic era.[33] This leaves a margin of sixteen years which must needs be narrowed. Unfortunately, we cannot attempt that task in this paper.

The book is written in Pārsi Darrī.[34] The term Darrī, derived from the term darbār, signifies language used in the king's darbār, or court. The custom of calling the court language Darrī apparently goes at least as far back as the Sassanians.[35] Ibn al-Nadim (ca. A.D. 935-990/991) says that the Darrī, as a proper language (and the court language), came "chiefly from the language of the people of Khurāsān and the East, the speech of the people of Balkh."[36] Avicenna's family also hailed from Balkh, but by Avicenna's time Pārsi Darrī, while retaining the significance of "court Persian," had also probably come to signify the common language of the populace, as opposed to Pehlevī on the one hand and Tāzī (i.e., Arabic) on the other.[37] So when Avicenna wrote the Dānish Nāmeh, he wrote a book in the spoken language of the Persian royal courts and the language understood by the general populace, who nevertheless retained their local dialects.

The literary situation in the Persian language in the Islamic fifth century is reflected by Browne, when he reports that we have

scanty knowledge of Persian prose works before the middle of the fifth century A.H.[38] He might well have added that except for Dānish Nāmeh we have no knowledge of a philosophical work in Persian belonging to this era.

The absence of philosophical literature in the Persian language does not, of course, mean the absence of philosophical literature or output in Persia. On the contrary, many of the major contributions to Islamic philosophical literature came from scholars and philosophers in Persia; but they wrote in Arabic, the common literary language of the Muslim world.[39]

Thus, Avicenna's writing a philosophical work in Persian in ca. A.H. 412-428 is a major departure from the usual philosophical literary practice of his day.

Avicenna seems to have been conscious of this. For example, instead of just enumerating the subjects he wishes to discuss, he is also attentive to the language; for he says that the king's order is "that it is necessary that I, one of the servants of his court, write in Pārsī Darrī a book...."[40] Such a remark, which calls attention to the language used in the book, is not found in any of his other works. Also, in the Dānish Nāmeh, he seems to quite deliberately choose a Persian word where a more common Arabic word was available.[41] Finally, Avicenna makes specialized use of Persian words to replace technical philosophical Arabic terms.[42]

Such departures from the usual practice as we have just mentioned indicate that Dānish Nāmeh is most probably the first such effort in post-Islamic Persian.[43] Thus Avicenna "can claim to be the actual originator of Persian philosophical language."[44]

At the present stage of our studies, it is not possible to determine the extent of educational use, popularity, and reception of this book either in Iran or the Muslim world at large.[45] The book may have been used in the palace school of Sultan Muhammad II (Fātiḥ) "the Conqueror" (r. A.D. 1444-1446 and again A.D. 1451-1481) in Istanbul,[46] in which case perhaps its use for instructional purposes was fairly well established. However, the book seems already to have been rare in the 1700's and most likely even before.[47] Evidently, the book was overshadowed by the voluminous Avicennian philosophical corpus in Arabic.[48]

TRANSLATIONS AND PRINTED EDITIONS

There is a French translation, by Mohammad Achena and Henri Massé, of the first two sections (logic and metaphysics) of Dānish Nameh. This translation was published in Paris in 1955 and is entitled, Avicenne: Le Livre de Science, Vol. I.

The first printed edition that we know of was printed in Hyderabad (Deccan), India,[49] in A.H. 1309, that is, ca. A.D. 1891. This edition includes the Dānish Nameh in its entirety. However, it reproduces only one manuscript which is neither identified nor discussed.

Another edition[50] came out in Tehran, Iran, in A.H. 1315 (ca. A.D. 1936). This edition is confined to the metaphysics section of the Dānish Nameh.

Finally, the third edition was published from Tehran in A.H. 1371 (A.D. 1952) as part of the commemoration of the millenary of Avicenna's birth. This edition is complete in a series of books, one on each section of the Dānish Nameh, edited either collaboratively or by

different individual editors. This is by far the best edition available so far.

The printed edition of the logic section of the <u>Danish Nameh</u> is a collaborative effort by Muhammad Moin and Syed Muhammad Mishkat. This, we have already said, is the best edition available to date. The editors compare ten manuscripts[51] and quote the variants.

Yet there are some very serious difficulties with this edition. The editors do not record variants for each word per line. There is a large number of places where it is nearly impossible, without a restructuring of manuscripts either in whole or in part, to determine where in the text the variation occurs, and whether it is merely a variant reading or an omission or, on the contrary, an addition. We cite a few representative examples.[52] Part of the variation for p. 21, L. 8, is actually noted as footnote 4, belonging to p. 22, L. 3. The variation is not clearly brought out on p. 42, L. 9, n. 13. The variation for part of p. 47, L. 8, actually occurs on p. 49, n. 1. Variations for manuscripts ＞ (dal) and كب (kāf bay) are recorded on p. 74, n. 1, whereas they actually belong to p. 73, L. 8. This particular error, however, may be attributed to a printing error, where the last word " بود " (bood) of p. 73, L. 8, is repeated as the first word on p. 74, L. 1. On p. 51, nn. 5-9, and p. 52, nn. 8-11, it is impossible to say where the variations belong and what exactly they are, without a restructuring of the manuscript material. In short, we have had to restructure a large number of passages from various manuscripts, particularly ں , to determine exactly what a given variation was and where exactly it belonged. In fact, an intercollation

with the Moin and Mishkat edition would have been impossible without
such an undertaking.

Other difficulties have to do with punctuation which could have
affected the meaning of the author, for example, on p. 9, L. 3. Yet
another set of difficulties centers on adoptions which seriously
affect the intent of the author. For example, on p. 34, LL. 7-8, the
editors adopt chunīn both for the antecedent and the consequent
in Avicenna's example of a conjunctive conditional (or a hypotheti-
cal) proposition. If we let 'p' stand for chunīn, which itself
stands for a proposition, we have Avicenna saying that an example of
a conjunctive conditional proposition is 'if p then p'; there is,
of course, logically nothing wrong with this example, but clearly
this is a special case of 'if p then q',[53] and it is this latter
which Avicenna clearly intended as an example. Thus, instead of
chunīn, chunān should have been adopted. Such a reading was
available.[54]

THE PRESENT EDITION

We have made a new edition of the logic section of Dānish Nāmeh-i
'Alāī. Only approximately half of this is the subject of our study
in this paper. The half which is studied here is enclosed from page
24 to 92.

We were fortunate in being able to consult two manuscripts that
have never been made use of in any previous edition of Dānish Nāmeh.
One of these manuscripts is preserved in the British Museum Library
and the other in the India Office Library. These manuscripts are

fully described and discussed below. We do not include a list of manu-
scripts used by Moin and Mishkat, as, other than having the Moin and
Mishkat record of variations, the manuscripts were inaccessible
to us.

Our manuscripts are:

Ms.A.: This manuscript is Ethé 218, I.O. 478, preserved in the
India Office Library, London. It measures 8 1/4 inches by 4 7/8
inches, has 168 folios with an average of 14 lines recto and the same
verso. The section on logic begins on folio 2^a and ends on 44^b, and
it is scribed in the Naskhī style.[55]

The year the transcription of the logic section was finished
is dated by the scribe, as also noticed by Ethé, as A.H. 1064 (A.D.
1654). However, if we read further down folio 44^b we read on lines
4 and 5 the following, "fī al-Khāmis Ghurra shahr Jamādī al-awwal,"
which, strange as the expression is, most likely means "the fifth day
of Jamādī al-awwal." That is to say, the transcription finished the
fifth Jamādī al-awwal A.H. 1064, that is March 24, A.D. 1654.

The writing is clear and easy to read except for those places
that are faded. The main section headings are all in red ink. Be-
cause of fading, various places from folios 1-7 are unreadable, but
starting with folio 8 the section on logic is very clear.

Folios 3-5 are out of order,[56] but this does not seem to be a
scribal error, since once the folios are placed in order there is no
discontinuity in the material.[57] We might also note that the last
four lines of folio 16^a are repeated as the first four lines of folio
16^b. This indeed is a scribal error.

There is a consistent orthographical replacement of _juzwī_ by _juz'i_ and of _qiyāsha_ by _qiyāsha'ī_, and _gawhar_ is replaced by _jawhar_. These examples indicate that either the manuscript from which "A" was transcribed had these changes, or that the scribe (perhaps unconsciously) wrote the Arabic in place of the Persian terms. The other deviations are mostly scribal style[58] and omission of dots which are of no philosophical interest.

_Ms.B._: This manuscript is Or. 16,830, preserved in the British Museum Library. It measures 9 inches by 4 3/4 inches. This manuscript, consisting of _Dānish Nāmeh_ in its entirety, has 283 folios. The logic section consists of folios 3[a] to 66[b].[59] There is an average of eleven lines each recto and verso per folio. It is scribed in the _Nastā'liq_ style, which is the common Persian style. Unlike manuscript A, manuscript B has no date. The best we can do is refer to the note of the penultimate owner,[60] who penned A.H. 1127, ca. A.D. 1715, as the date when he obtained the manuscript. According to William Yule,[61] the different parts of the manuscript are from the 17th and 18th centuries. The logic section would probably be from the 17th century, but we cannot be sure of the date at all.

Manuscript B is entitled _Dānish Nāmeh_. The manuscript is surprisingly well preserved and easy to read, the only serious fading being a short one on folio 39[a]. The main section headings have been underscored, most likely by the scribe himself.

There are a large number of marginal corrections, seemingly in the scribe's handwriting; and repetitions are crossed out, for example, a part of the last line of folio 21[b] and a part of the first line of folio 22[a].

"B," as will be noticed from the collation, has many more explanatory words and phrases. We are appreciative of the skill with which they have been blended in the text. These have been of some help to us in understanding the text.

Like "A," "B also, in places, adopts Arabic orthography for Persian. There is a consistent orthographical replacement[62] of صغرا by صغری (both pronounced sughra), and کبرا by کبری (both pronounced kubra). Replacement of ḥamlī by ḥamliah, munfaṣil by munfaṣilah can also be found.

The 1952 printed edition was also used in the formulation of our best. This edition is designated by the letter P in the collation. Whenever necessary we also adopted readings from the manuscript variations quoted in the printed edition. Only those Moin and Mishkat manuscripts from which adoptions were made are collated by means of enclosing their names within corners (i.e., "< >"). These manuscripts are described in the printed edition, and we have retained the sigla used therein.

The procedure followed as to compare and collate "A" and "B" with the printed edition. Variation for each word or phrase was recorded, one each on a separate line. Appropriate symbolism[63] was used to indicate, without ambiguity, whether the word or phrase was an omission or an addition or simply a variant reading.

The printed text was examined once again in the light of this collation, but, this time, also with respect to the manuscript variants[64] quoted in the printed version. It was at this stage that questions of adoptions, omissions, and variations were considered, and our text started taking shape. At this stage also the printed variations and the adaptions of the manuscript variations quoted in the printed version were intercollated with "A" and "B".

Obviously, in such a task language is a consideration. As far as possible we have guarded the text against modernisms, whether they be late expressions, sentence structures, or spellings. We have also tried to guard the text against later interpolations. We have avoided as many Arabic words as possible, that is, if Persian equivalents were available in the manuscripts. Though in this work Avicenna formulates philosophical vocabulary in Persian, even he could not nor would have wanted to eschew all Arabic philosophical technical terms.

Because of these considerations, and Avicenna's own style in this work, we have made no attempt to make the text smooth. We should also remember that Avicenna was not contributing to belles lettres but writing a book in philosophy. Thus philosophy, not language, has been our major consideration. We have chosen that language which makes the best philosophical sense, which does not make him commit errors he himself would have avoided, and which clarifies his philosophical intent and meaning as far as possible even though the language be strained. This, in fact, has been our guiding principle both in formulating the text and attempting its translation.

The text has been divided into "Avicenna's Preface," "Avicenna's Introduction" and thirteen chapters in order to facilitate its reading and discussion. The translation also reflects these divisions.

A translator cannot completely detach himself from the role of an interpretor nor should he. His role as an interpretor is best when it is minimal. He should let the author speak. We have, therefore, tried to make the translation literal. Paraphrasing has been avoided, but we have expanded the translation by use of square brackets within the body of the translation. The square brackets in the margins and notes,

however, correspond to Persian page numbers. The unbracketed numbers in the margins refer to Persian line numbers for the Persian page number.

Avicenna does not use logic symbols, but, in order to facilitate the discussion of certain points, we have used ' $\supset$ ', 'V', and '&' as abbreviations for the English expressions, 'if...then', 'or', and 'and', respectively. We have also used parentheses as grouping indicators. Thus, '(p&q) $\supset$ (pVr)' is to be read 'If p and q, then p or r'.

The book Danish Nameh, in its entirety, consists of logic, physics, metaphysics, and mathematics.[65] Avicenna himself completed the sections on logic, physics, and metaphysics and some parts of mathematics which were lost, and so his pupil, Juzjani, completed the whole section of mathematics relying on various Avicennian sources.[66]

Danish Nameh then is an encyclopedic work as are the Shifa' (The Book of Remedy) and the Najat (The Book of Deliverence). As such the logic section considered in this study is a part of this larger work.

The section on logic in Danish Nameh starts with a preface in which Avicenna declares his plan for the book. While enumerating the planned sections, he exhibits a classification of sciences which is Aristotelian.[67] Yet, in a subsequent passage, he informs us that, contrary to the usage and custom, he is, after completing logic, going to begin his exposition with sciences "at the higher level [namely metaphysics]" and move gradually to the sciences lower down.[68] The "usage and custom," of course, refers to the presentation of the Aristotelian corpus in which the Metaphysica follows the Physica. But with respect to the objects studied by each of the three theoretical sciences,[69] and whether their objects are separable and immutable or not (i.e., from sensible matter), Aristotle leaves no doubt that

"the speculative sciences are to be preferred to the other sciences, and 'theology' to the other speculative sciences."[70] Since the object of philosophy "can be only Being as such"[71] and since metaphysics is the science which studies being _qua_ being, Aristotle himself calls it "first Philosophy." Thus Avicenna's arrangement is contrary to custom and practice, but it is in keeping with Aristotle's own teachings about the relative positions of the theoretical sciences. We may perhaps say, with hesitation, that the Avicennian arrangement of the books of Dānish Nāmeh is reflective more of the Aristotelian ontology than his epistemology.

Avicenna in his preface does not attempt to classify logic in any one of the sciences but construes it as a necessary preliminary to any science. It is nevertheless termed an '_ilm_' (science), which, in this appellation and subsequent discussion,[72] suggests that logic is to be taken as a specific theoretic discipline. While logic in itself has no loss or gain,[73] which suggests its subject neutrality, logic is called a balance which can separate the certain from the uncertain, and thus knowledge from non-knowledge,[74] a characterization which suggests both its instrumentality and pervasiveness.

This view of logic is in keeping with the Parapatetic tradition. Aristotle himself does not explicitly state whether logic is an instrument of philosophy or part of philosophy. Andronicus' calling the collection of Aristotle's logical works the Organon, however, indicates that the later antiquity accepted logic as an instrument of science. The decision whether it is exclusively one or the other may reflect on the nature of logic, but the decision depends more on how one construes science and art and the relation between these.[75]

The main purpose of the development of logical theory for Avicenna seems to center on the process of tasdīq (verification or justification) which, in the end, is an epistemological concern.[76] This concern cannot be met without the theoretical development of logic, which in turn cannot be accomplished without considering logic, internally, as a special intellectual discipline in its own right.

Thus, for Avicenna logic is a special theoretical discipline which also serves as an instrument of the sciences. This we consider to be the view of the Dānish Nāmeh, and it is corroborated by the Shifā'.[77]

The logic book of the Dānish Nāmeh is unlike the Shifā' and also the Organon in that the Dānish Nāmeh does not divide logic material in separate books as do both the Shifā' and the Organon. Rather the topical structure of Dānish Nāmeh parallels that of the Najāt. But the presentation of topics, as in the Najāt, reflects broadly the organization of the Organon. Internally, though, since Dānish Nāmeh is not a commentary on Aristotle, Avicenna is selective of his material.

From the point of view of logic the book may be divided into two sections between simple and compound terms; from an epistemological point of view the division, which covers exactly the same material, is between tasawwur (simple comprehension) and tasdīq (verification). The first section (Chapters I-IV) is a rapid and selective presentation of the materials basically from the Categories of Aristotle and Porphyry's Eisagoge. The Aristotelian categories are neither mentioned nor discussed, and the material presented seems to range over only chapters two and three of the Categories. As far as the

Eisagoge material is concerned, it too is presented swiftly and is confined to definitions and short discussions of the predicables.[78]

Besides acquainting the reader with basic distinctions and vocabulary, the important logical task of the section, as we see it, is to classify terms as simple (*mufrad*) and compound (*murakkab*) and as singular (*juzwī*) and general (*kullī*). It also considers essential (*zātī*) or accidental (*'arz̲ī*) predication. This depends on whether the attribute referred to by the general term,[79] which serves as the predicate, is an essential attribute of the subject or not. The issue of essential predication is, of course, central to the theory of definitions. For "the purpose in a definition is to know the true nature of a thing;"[80] that is, a definition gives us the essence of a thing, that is, its essential attribute. In fact, it is this feature of a definition which separates it from a description.[81] But in virtue of what is an attribute essential, and how is it known? It is in the light of the answer[82] to this question that essential predication is to be understood. The answer would depend largely on the analysis of Avicennian metaphysics. But that task is beyond the scope of this paper.

The first section ends with Chapter IV which begins the subject matter of Aristotle's *De Interpretatione*. Avicenna once again is selective and interjects a chapter on conditional proposition. The *De Interpretatione* material ends with Chapter VIII, and the *Analytica Priora* material begins with Chapter IX. A chapter on conditional syllogism is added. The subject matter of *Analytica Priora* is followed by *Analytica Posteriora*; Avicenna skips the main part of the *Topica*, and the book ends with the appendix to the *Topica*, *De Sophisticis*

Elenchis, evidently thinking that the important parts of the _Topica_
had already been covered in Chapter II. The _Rhetorica_ and the _Poetica_
which are included in the _Shifa'_ are excluded here. Thus the bulk of
the _Danish Nameh_ book on logic is in the second section.

Our own text, translation, and notes for this study end with
Avicenna's discussion of _reductio ad impossibile_.

The main concern of the second section of the _Danish Nameh_ book
on logic is with compound expressions, that is to say, with various
types of propositions and their combinations resulting in a syllogism.

Avicenna defines a proposition as the result of the combination
of simple terms, any one of which "is [such] that when you hear it
you may [properly] say [of it that] it is true, or [else that] it is
false."[83] As in Aristotle,[84] and in accordance with this definition,
supplications and commands are exempted from being propositions.[85]

We might remark here that Avicenna introduces three terms:[86]
qadiya, _khabar_ (report), _sokhan-e jazim_ (judgmental discourse). The
last is the Persian equivalent for _hukm_ which means "judgment." Of
these, he almost exclusively uses _qadiya_ to mean "proposition."

Propositions are divided into predicative (_hamli_), and two types
of conditionals, viz., conjunctive conditional (_sharti muttasil_)
and disjunctive conditional (_sharti munfasil_).

Following Aristotle, the subject-predicate proposition is
classified both according to quality and quantity. Again following
Aristotle,[87] indefinite propositions, which Avicenna calls "indeter-
minate propositions," are considered the same as particular proposi-
tions.[88] But Avicenna does not offer the same argument as Aristotle
for construing an indefinite proposition as a particular proposition.

Aristotle's reason for equating the two is that they both have the same inferential force.[89]   Avicenna, however, explicitly bases his argument on the interpretation or the semantics of the quantifiers:

> "The indeterminate...judgment is [really] a particular judgment...for the reason that when you say 'man is such [and such]', [then in] your utterance [the term] 'man' may [mean] 'all men' or...'one man' in that 'all men' are men and 'one man' is also a man. Therefore, ['man' means] 'some men' with certainty and 'all men' [only] with doubt."[90]

Evidently, Aristotle also had the semantics of the quantifiers as the basis of his assertion; if so, Avicenna explicates the argument.

Another thing to be noticed about the Avicennian interpretation of predicative propositions is the interesting fact that he asserts that the proposition that every many is an animal is the same as the proposition that whatever is a man is an animal.[91] This raises interesting prospects and questions. Does he, for example, translate other predicative propositions into sentences of first-order predicate logic? We have not found other such attempts in the Danish Nāmeh; there may be clues in his other works on logic, but unfortunately they have not yet been studied.

Aristotle introduced term variables for the first time in the Analytica Priora.[92] Avicenna also introduces letters of the alphabet as variables in the Danish Nameh and is aware of the fact that they may replace either simple terms or compound terms;[93] but, whereas Aristotle used the letters as term variables, Avicenna does not. Rather he uses words which are grammatically particles and which may indiscriminately be translated as 'such', 'so', and 'that', etc., in contexts where we might use 'such and so', 'this and that', and 'thus and so', etc. Avicenna turns these, by his use, into discrete symbols.

He makes them do double duty, however, in that he uses them as term variables in predicative propositions and as propositional variables in conditional propositions.[94]

Avicenna, as previously mentioned, considers two types of conditional propositions in Chapter VII of the Dānish Nāmeh. These propositions, Avicenna points out, are distinguished from the predicative propositions by the fact that whereas predicative propositions have terms as their constituent parts, the conditional propositions have propositions as their constituent parts.[95] But whereas conjunctive conditionals are confined to having only two parts[96] the disjunctive conditionals are not.[97]

Conjunctive conditionals are propositions that result from joining two propositions by means of 'if...then'. He is careful to point out[98] that the term 'if' and the term 'then' are not to be included in the antecedent (muqaddam) and the consequent (tali), respectively.

These propositions pose some interesting problems in Avicenna's logic. For example, the semantics of the connective 'if...then' in the Dānish Nāmeh is not clear. The solution will have to rest on two factors: first, the interpretation of sazgārī and nāsāzgārī,[99] and second, the evidence from other sources analyzed and sorted out. This latter, as we have pointed out in several other places, is not at hand.

Disjunctive conditionals result by combining two or more propositions by 'or.'[100] The problem is to decide whether the term ya, that is 'or', is to be taken as being synonymous with the Latin 'vel' or the Latin 'aut'. The task of interpreting sāzgār and nāsāzgār is somewhat easier here. There seems to be a good case for taking 'or' as exclusive.[101] Yet when, what seem to be paradigmatic examples of

inferences in the Ishārāt are examined, it turns out that they exhibit

forms that are validating in either case. In fact, it would seem that

Avicenna has both and is aware of the distinction.[102] But corrobora-

tive evidence and further analysis is required. He also says that

there is a form of syllogism which pertains to conditional proposi-

tions. This he calls the istethnā'ī syllogism.[103] Paradigmatic

examples clearly indicate that what he intends by istethnā'ī syllogism

is to cover the rules of modus ponens, modus tolens and the disjunc-

tive syllogism.

There have been some problems in translating the term istethnā'

from which the adjective istethnā'ī is derived. In the literature

istethnā' is taken to indicate exception, and the istethnā'ī syllogisms

are called exceptive syllogisms in contrast to categorical syllogisms

which are called iqtirānī (conjunctive) syllogisms.

One may adduce two obvious reasons for calling istethnā'ī syllo-

gisms exceptive syllogisms. First, the term istethnā' means exception,

taking out, or setting aside. Second, Avicenna's practice, in his

discussion of arguments patterned after modus ponens, is to introduce

the second premiss by the word laikin (but),[104] which is an istethnā'ī

(exceptive) particle in Persian. Thus, in view of the meaning of the

term istethnā' and Avicenna's use of the word laikin, there would seem

to be a prima facie case for calling istethnā'ī syllogisms exceptive

syllogisms. However, the inferential process indicates otherwise;

for an examination of the form reveals that we have a proposition

'if p then q' which is a compound of two propositions; to this com-

pound we add another proposition 'p', and, by virtue of this addition,

we draw the conclusion 'q'. A recent study of the term istethnā'

discloses that the term in question was used in Arabic to also trans-
late the Greek terms _prosthesis_ and _prosdiorismos_ which imply
addition.[105] Still, we notice with respect to the first premiss,
that although the antecedent is added (_istethnā'_), the consequent
is excepted or detached (_istethnā'_); both of these processes belong
to the same inferential movement, so it seems that the term _istethnā'_
is used here ambiguously to indicate both the processes: i.e., one
of structuring the inference and the other of inferring.

Avicenna's discussion of conditional propositions, and, for
example, _modus ponens_, poses a historical question also, namely, what
are Avicenna's historical sources?

Although Aristotle presents his syllogistic figures in conditional
form,[106] his known writings do not contain a special treatise devoted
to the logic of conditional propositions. He uses _modus ponens_, for
example, but does not explicitly state it as a validating form or a
rule of inference. It is plain, from Avicenna's discussion of condi-
tional propositions, that Avicennian sources cannot be directly
located in the Aristotelian corpus. His discussion, rather, reflects
his reliance on Stoic sources; but we have no evidence of any Stoic or
Megaric logicians being translated into Arabic.[107] Evidently Avicenna's
sources must be found in Aristotle's later Greek commentators.

Turning to conjunctive syllogisms, that is, categorical syllogisms,
the Avicennian presentation follows Aristotle.

In all three figures, Avicenna states the various combinations of
A, E, I, O propositions, taken as pairs, which yield valid conclusions
in the figure in question. Yet, as we have noticed,[108] he is not able
to rule out by this process certain invalid combinations.

In regard to many problems of interpretation that have been raised in this study, we may add here that their solution may well lie in the study of Aristotle's Greek commentators. We have, however, confined our references to Aristotle. No doubt Aristotelian doctrines, as commented upon by his Greek commentators, reached Avicenna, and he should also be studied in the light of these commentaries; but this is not done here because it is a much wider problem, appropriate for a more encompassing study than the present one.

بسم الله الرحمن الرحیم

سپاس ۔ دستایش مر خداوند افریه گار و
بخشاینده خرد را

و دورد بر پیامبر گزیده دی محمد مصطفی، و
بر اهل بیت و یادان دی

فرمان بزرگ خداوند ما ملک عادل مؤید
منصور ۔ عضد الدین علاء الدوله و تخر الملة و تاج الامة
ابو جعفر محمد بن دشمنزیار مولی امیر المؤمنین
زنده گانیش دراز باد و عزش پیروز، و پادشاهیش
بر افزون آمد حمی بنده و خادم دوگاه دی که یافتم
اندر خدمت دی هم کامهای خویش از این دبزرگ
و شکوه و کفایت و پرداختن بطلم و نزدیک داشتن
دی پایه که مرنهادمان مجلس دی دا کتابی تصنیف کنم
بپارسی دری که اندر دی اصلها و کتابها پنج علم اندحمای
کمی پیختلان گرد آودم بغایت اختصار.
یکی علم مطلق که دی علم فراندوست.
ددم علم طبیعیات که علم آن چیزهاست که حس

بسم الله الرحمن الرحیم

سپاس ۔ وستایش مرخداوند افریدگار

بختشاینده خرد را

و ددود بر پیامبر گزیده دی محمد مصطفی، و

براهل بیت و یادان دی

فرمان بزدگ خداوند ما، ملک عادل مؤید

منصور ۔ عضدالدین علاء الدولة و فخرالملق وناج الائمه

ابو جعفر محمد بن دشمنزیاد مولی امیر المؤمنین

زندگانیش دراز باد وبخت پیروز، و پادشا هیش

بر افزون، آمد بمن بنده و خادم دوگاه دی که یافتهام

اندر خدمت دی همه کامهای خویش از ایمنی و بزدگی

و شکوه وکفایت، و پرداختن بعلم و نزدیک داشتن

که باید که مرخادمان مجلس دی دا کتابی تصنیف کنم

بپاسی ددی که اندر دی اصلها و نکتهاء پنج علم ازعلمهاء

حکمت پیشینگان گرد آورم بغایت اختصاد ۰

یکی علم منطق که دی علم ترازوست ۰

دوم علم طبیعیات که علم آن چیزهاست که بحس

[2] بشاید دیدن، و اندر جنبش و گردش انداز آفریدگار

و سِتُم علم هیأت ــ و نهاد عالم و حال صورت
جنبش آسمانها و ستارگان . چنانکه باز نموده اند که چون
بشایست حقیقت آن دانستن .

و چهارم علم موسیقی و باز نمودن سبب ساز و
ناساز آوازها، و نهادن لحنها .

و پنجم علم آنچه بیرون از طبیعت است .

و چنان اختیار افتاد که چون پرداخته آید از
علم منطق حیله کرده آید، که آغاز از علم برین
کرده شود، و به تدریج بعلمهای زیرین شده آید،
بخلاف آنکه رسم و عادت است ــ پس اگر جای
چاره نبود از حوالت، بعلمی از علمهای زیرین
کرده آید

پس من خادم هر چند که خویشتن را پایگاه
این علم ندانستم، و این علم را افزون از قدر
خویش دیدم، گمان بردم که چون طاعت و
فرمان دل نعمت خویش بِرَم، بهر نجستگی طاعت

[3] توفیق باد آورد؛ و توکّل کردم بهر آفریدگار
خویش و بفرمان بردادی مشغول شدم .

[۴]   باز نمودن غرض اندر علم منطق و فایده اندر وی

دانستن دو گونه است:

یکی ـ اندر رسیدن که بتازی تصور خوانند. چنان که اگر

کسی گوید: مردم، یا پری، یا فرشته، و هر چه بدین ماند تو فهم کنی

و تصور کنی، و اندر یابی که بدین لفظها چه می خواهد.

و دوم ـ گرویدن چنان که بگروی که ـ پری هست و مردم زیر

فرمانست، و هر چه بدین ماند و این را بتازی تصدیق گویند.

و این هر دو دو گونه اند:

یکی آنست که با اندیشه شاید اندر یافتن، و چاره نبود

که اورا بطلب از راه خرد شاید بجای آوردن چنان که

اندر رسیدن بچیم چیزی دوان، و تصور کردن وی؛ و

چنان که گرویدن بنا مردن دوان، و تصدیق کردن بوی.

و دیگر آنست که : اورا اندر یابیم، و بوی بگرویم

نه از جهت اندیشه، و نه بطلب خرد، بلکه باول خرد

دانیم. چنان که دانیم که هر چه برابر باشند با یک چیز

که هر یک چند وی بوند یک با دیگر نیز برابر بوند.

یا بحس، چنان که دانیم که آفتاب روشن است.

[5]   یا پذیرفته باشیم از بزرگان و دانایان چنانکه از صاحب شریعتان و امامان .

یا چیزی باشد که اتفاق مردم بروی بود و بروشن ما بروی بوده باشد . چنان که گوییم : دروغ زشت است . و ستم نباید کردن .

یا بروی دیگر از رویها که سپستر یاد کرده آید .

و هرچه تصور وی ، یا تصدیق وی ، با اندیشه بجای آوردن پیش از وی باید که چیزی دیگر دانسته باشیم ـ تا نادانسته را بوی بدانیم .

و مثال این در باب تصور ـ آن که : اگر مارا دانسته نباشد که مردم چه بود ، و کسی مارا باز نماید و گوید که مردم جانوری بود گویا ؛ باید که ما نخست دانسته باشیم معنی جانور و معنی گویا ، و اندر رسیده باشیم بایشان ـ پس آنگاه آنچه ندانسته باشیم از معنی مردم بدانیم .

و مثال این در باب گرویدن و تصدیق آن که : اگر مارا دانسته نباشد که عالم محدث است ، و کسی مارا

[6] باز نماید و گوید که : عالم محدّث است ، و هرچه محدّث بود عدث بود . باید که ما گرویده باشیم و دانسته که عالم محدّث است . و نیز گرویده باشیم و دانسته که هرچه محدّث بود محدث بود ـ پس آنگاه آنچه ندانسته باشیم از حال محدثی عالم بدانیم .

پس هرچه ندانیم و خواهیم که بدانیم بچیزها دانیم که اوّل ایشان را دانسته باشیم . و هرچه نادانسته بود، بدانسته دانسته شود .

و لیکن نه هر دانسته ای را راه برد بهر نادانسته ؛ که هر نادانسته را دانسته ای هست اندر خود وی، که از وی شاید اورا دانستن ؛ و داهیست که بدان را راه شاید شدن از دانسته بنا دانسته نادانسته شود .

و علم منطق آن علم است که اندر وی پدید شود حال دانسته شدن نادانسته بدانسته ؛ که کدام بود که بحقیقت بود، و کدام بود که نزدیک بحقیقت بود و کدام بود که غلط بود ؛ و هریکی چند گونه بود .

و علم منطق علم ترازوست و علمهاء دیگر علم سود و زیان است .

[7]   در دستگاهئ مردم بیاکی جان است، و پاکی جان بخودت بستن هستیهاست اندر وی، و بدور بودن از آلائش طبیعت . و داء بدین هردو بدانش است، و هر دانشی که بتر ازو سختۀ نبود یقین نبود پس بحقیقت دانش نبود . پس چاره نیست از آموختن علم منطق .

و این علمهاء پیشینگانرا خاصیت آنست که آموزندۀ وی باقبل کار ندانند که فایدۀ چیست اندر آنچه همی آموزند، پس بآخر یکباره بدانند، و بفایدۀ آن اندر رسد و بغرض وی .

پس باید که خواننده این کتاب را، دل تنگ نشود بشنیدن چیزهائی که زود فایده را ننماید .

آغاز علم منطق [8]

پدید کردن

آنچه مفرد خوانند از لفظها و معنیها

لفظ مفردِ و مرکب : باید که دانستة آید که لفظ دوگونه بود
یکی را مفردِ خوانند . چنانکه گوئی : زید و محمد ؛ و چنان
که گوئی : مردم ، و دانا .

دیگری را مرکب و مؤلف خوانند . چنان که گوئی :مردم
دانا است ، یا گوئی : مردم دانا . و تا حال لفظهاءِ مفرد
دانسته نیاید حال لفظهاءِ مرکب دانسته نیاید .

پدید کردن لفظ کلی و جزوی

هر لفظی مفرد یا کلی بود یا جزوی .
کلی آن بود که بیک معنی بر چیزهائی بسیار شاید
که افتد برابر . چنان که گوئی:مردم ؛ که مردم بیک
معنی بر زید افتد و بر عمرو ، و بر بکر ، و اگر چنان بود
که بریک چیز افتاده بود ، تو توهّم توانی کردن که
که او را بر چیزهاءِ بسیار افکنی . که بوهم توانی از آن

[10] معنی چیزهای بسیار اندیشیدن چنانکه توانی اندیشیدن افتابهای بسیار، و ماهتابهای بسیار.

و جزوی آن بود که بیک معنی نشاید که جز یکچیز درا افتد، و نتوانی همان معنی ورا بهرچیزی دیگر افکندن. چنانکه گوئی زید، که معنی زید جز زید را نبود. پس اگر چیزی دیگر را زید خوانی بمعنی دیگر خوانی، نه بهمان معنی.

و اهل علم را مشغولی نیست بحال الفاظ جزوی و معنیهای جزوی، بلکه شغل ایشان بمعنیهای کلی است. و شک نیست که هر کلی را جزویها اندر زیر بود.

باز نمودن کلی ذاتی و عرضی

کلی مر جزویهای خویش را یا ذاتی بود یا عرضی. و ذاتی آن بود که چون معنی وی بدانی، و معنی جزوی وی بدانی. سه حال بدانی هر آینه: یکی آن که بدانی که آن جزوی را آن معنی هست،

[۱۱] چنان که چون بدانی که حیوان چه بود، و مردم
چه بود، و شمار چه بود، و چهار چه بود، نتوانی که ندانی
که مردم حیوانست، و هم چنان نتوانی که ندانی
که چهار شمارست. و لیکن اگر بدل حیوان و
شمار، موجود نمی، یا سپید نمی، توانی کردن که
ندانی که مردم هست، یا چهار هست، یا مردم
سپید ست یا نیست.

و دیگر آنکه بدانی که نخست آن معنی که ذاتی
است باید که بود، تا آن معنی آن چیز جزوی را بود
چنان که باید که نخست چیز حیوان بود تا آنگاه او
مردم بود. و باید که نخست شمار بود تا آنگاه او
چهار بود، و باید که مردم بود تا آنگاه او زید بود.

و سوم ـ آنکه بدانی که هیچ چیز آن جزوی را
آن معنی نداده بود، بلکه او را آن از خود بود.
چنانکه بدرست بدانی که هیچ چیز مردم را حیوان نکرد،
و چهار را شمار نکرد، و الا اگر آن چیز نبودی،
مردم بودی نا حیوان، و هم چنان چهار بودی

ناشمار، و این عال بود .

و معنی گفتار ما که چیزی چیزی را چنین کرد
آن بود، که آن چیز بخودی خود چنین نبود، و لیکن
از بیرون چیزی دیگر اورا چنین کرد . و اگر نشاید
که چیز خود جز چنین بود، پس چیزی اورا
چنین نکرده بود .

آری آن چیز که مردم را بکرد، حیوان را بکرد،
و لیکن مردم را حیوان نکرد، که مردم خود حیوانست.
و چهار خود شمارست ، و سیاهی خود گونه است . و
این نه چنان است سپیدی که مردم را ، که چیزی بود
که مردم را سپید کند اندرد طبع وی ، و بیرون از طبع
وی . و نه چنان است هستی مردم را که چیزی باید
که مردم را هستی دهد .

پس هر معنی که این سه حکم ورا بود، وی
ذاتی بود . و هرچه ازین حکمها یک حکم ورا نبودوی
عرضی بود .

وعرضی بود که نشاید که هرگز برخیزد ازچیز،

[13] و نه نیز بوهم. چنان که از هزار جفتی و چنان که از مثلث بودن سه زاویهٔ او هم چند دو قایمه که بپست تفسیر این دانسته شود. و چنان که از مردم خندناکی بطبع؛ و لیکن اینان صفتهائی اند که پس از حقیقت چیز بوند.

و باید که این را بشرح نیز بگوئیم: هر مردم را دو صفت است؛ یکی بدیگر نزدیک. یکی ذاتی و دوم عرضی. چنان که ناطق، و تفسیر وی آن بود که مرا جان سخن گویا بود، آن جان که سخن گفتن و تمیز و خاصهاء مردمی از و آید.

و دیگر ضاحک، و تفسیر وی آنست که اندر طبع وی چنانست که چون چیزی شگفت غریب بیند یا شنود ورا شگفت آید. و اگر باز دارنده نبود از طبع یا از خوی شاید که بخندد؛ و پیش از این دو صفت باید که جان ببود نخست تا مردم ببود. پس چون این جان باتن جفت شود و مردم مردم شود، آنگاه خندناکی و شگفت دادی آید. پس بیین

[۱۴] وصف آنگاه همی آید که مردم مردم شود . و ازین
قبل را توانی گفتن که نخست باید که مردم را جانِ
مردمی بود ، تا مردم شود و تا خندان باشد
بطبع . و نتوانی گفتن که نخست باید که خندان باشد
بطبع تا او را جان مردمی باشد و مردم شود .
پس وصف پیشین ذاتی است بحقیقت ، و وصف
دوّم هر چند که هرگز از مردم بر نگیرد ذاتی
نیست که عرضی است .

و اما آن که گوئی زید نشسته است یا
خفته است . یا پیر است ، یا جوان است ، شک
نیست که عرضی است ؛ هر چند که یکی زودتر
بر گردد و یکی دیرتر ، بماند .

باز نمودن

جنس و نوع و فصل و خاصه و عرض

الفاظ کلّی همه پنج اند، سه ذاتی و دو عرضی
و ذاتی دو گونه باشند:

یکی آن بود، که چون بپرسی از چیزها که چه اند؟
که بدان پرسش حقیقت معنی ایشان خواهی، جواب
بدان لفظ ذاتی دهند؛ چنان که چون بپرسی که مردم
و گاو و اسب چه اند؟ جواب دهند که حیوان اند.
و چون بپرسی که سیاهی و سپیدی و سرخی چه اند؟
جواب دهند که گونه اند. و چون بپرسی که دو و
پنج و سه چه بود؟ جواب دهند که شمار اند. و همچنین
چون بپرسی که زید و عمرو و خالد چه اند؟ جواب
دهند که مردم اند.

پس حیوان و گونه و شمار و مردم اندر
جواب چه چیزی این چیزها افتد؟ و بتازی
این را جواب ما هو خوانند.

[16] و یکی آن بود که چون از کدامی هر یکی بپرسی
اندر خودیش جواب آن بود . چنان که بپرسی که مردم
کدام حیوان است ؟ گویند که ناطق . پس ناطق
جواب کدامی مردم بود . و بتازی جواب ای شئ
گویند . و چنان که بپرسند که چهار کدام شمار است ؟
گویند آن که بدو بار نیمه کردن یکی رسد .

و هر چه کلّی ذاتی بود و جواب ای شئ بود
آن را فعل خوانند .

و اما آن کلّی ذاتی که اندر جواب ماهو بود
از وی عامتر بود ، و خاص تر . چنان که جسم عام تر است
از حیوان و خاص تر است از گوهر . و حیوان عام تر
است از مردم و خاص تر است از جسم ؛ و هم چنین
شمار خاص تر است از چندی و عامتر است از جفت
مثلا ؛ و جفت خاص تر است از شمار و عامتر است از
چهار . و چهار خاص تر است از جفت و عامتر است از
این چهار و آن چهار . پس هر چه کلّی عامتر بود
جنسِ خاص تر بود . و هر چه کلّی خاص تر بود نوعِ عامتر بود

و چیزی بود که هم جنس بود و هم نوع . و چیزی بود [17]
که جنس بود و بس ، و زیر چیزی نوع نبود . چنان که
اندر این مثالها ، گوهر و چندی .

و چیزی بود که نوع بود و بس ، و جنس هیچ
نوع نبود ، زیرا که زیر وی کلی ذاتی اندر جواب
ما هو نبود ، بلکه زیر وی جزویّات بوند و بس .
چنان که مردم ، و چنان که چهار ؛ و چنان که سیاهی ،
که سیاهی از سیاهی دیگر آن جدائی ندارد بطبع ،
که گونه از گونه . زیرا که گونه ای از گونه آن جدائی دارد
که سیاهی از سپیدی ؛ و بفعل ذاتی مخالفت دارد .
و اما سیاهی از سیاهی جدائی ندارد بگوهر و فعل و
لیکن بحالهای بیرونی . چنان که یکی سیاهی زاغ
بود و یکی سیاهی مداد ، و زاغ و مداد چیزها اند
بیرون از طبع سیاهی ، و بودن سیاهی اندر زاغ
حالیت مر سیاهی را ؛ نه ذاتی هر چند که جدا
نتواند شدن از زاغ . و لیکن بوهم شایستی که همین
سیاهی بعینه اندر زاغ نبودی که اندر چیزی دیگر بودی .

وبالجمله جزو یعا که زیر یک نوع بوند یک

از دیگر جدائی بچیزی عرضی دارند . چنان که زید

از عمرو جدائی بدان دارد، که زید درازتر و

سپید تر بود مثلا؛ و پیرتر، و پس کسی دیگر بود

و از شهری دیگر . و این همه وصفهاء عرضی اند .

پس پیدا شد که چگونه بود نوعی که جنس نشود .

و این را نوع الانواع خوانند . یعنی نوع همه نوعها که زیر

وی اند .

پس پدید آمد که کلی ذاتی یا جنس بود یا

نوع بود یا فصل .

و اما کلی عرضی یا تنها مریک را بود، چنان که

خندناکی مردم را . و این را خاصه خوانند . یا

کلیها بیش از یکی را بود، چنان که جنبنده هم مردم را

و هم چیزی دیگر را . و چون سیاهی هم زاغ را و

هم چیزی دیگر را . و این را عرض عام خوانند .

پس هر لفظی کلی یا جنس بود، چون حیوان . یا

نوع بود چون مردم از حیوان؛ یا فصل بود، چون ناطق

[19] یا خاصه بُوَد چون ضاحک . یا عَرَض عام بُوَد
چنان که جنبنده ، و سپید و سیاه .

پیدا کردن

حال حد و رسم

غرض اندر حد شناختن حقیقت ذات چیز است
و جدائی خود بتبع آید .

و غرض اندر رسم نشان دادن است بچیزی
هر چند که ذات وی بحقیقت شناخته نیاید . و خود
نشان دادن جدا کردن را بود . پس حد از وصفهاء ذاتی
چیز بود .

و حد کردن آن بود که نزدیک ترین جنس چیز گیری
چنان که حیوان مردم را . و آنگاه فعل ذاتی وی بیاری
چنان که ناطق . پس گوئی مردم حیوان ناطق است .
پس این حد مردم بود . و هم چنان که گوئی چهار
شماری است که بدو باد نیمه کردن بیکی رسد .

و اما رسم چنان بود که گوئی ، مردم حیوانی است
خندان ، گریان ، و یعنی ناخن . یا چهار شماری
است که از ضرب وی اندر خویشتن شانزده آید . یا

[21] شماری است که از ضرب دو اندر خویشتن آید.

و باید که اندر حدّ و رسم چهار گونه خطا نیفتد، که هر چهار اندر یک معنی افتد. امّا آن معنی آن است که باید که هر چیزی که ناشناخته بود، و نخواهی که شناخته کنی، شناخته بچیزی کنی که از وی شناخته تر بود. و الّا هیچ فایده نبود اندر تعریف تو مر از او.

و امّا آن چهار معنی خطا که از این معنی شکافند:

یکی آنست که چیز را هم بخود شناسانند. چنان که اندر حدّ زمان گویند که زمان مدّت جنبش است؛ و مدّت و زمان یک چیز بود. و آنکس را که حدّ زمان مشکل بود او را حدّ مدّت نیز مشکل بود. و پرسیدن وی که زمان چیست؟ پرسیدن وی بود که مدّت چیست!

و دیگر آنست که چیزی را بچیزی شناسانند که آن چیز هم بچون وی بود، بپوشیدگی و پیدائی. چنان که گویند که سیاهی آن گونه است که ضدّ سپیدی است.

[22] و این اولیتر نیست از آن که گویند که سپیدی ای آن
گونه است که ضدّ سیاهی است، که سیاهی و سپیدی ای
بیک جایگاه اند، اندر پوشیدگی و پیدائی.

و سیّوم آنست که چیزی را بچیزی از وی
پوشیده تر شناسانند. چنان که گویند اندر حدّ آتش
که وی آن جسم است که بنفس ماند. و نفس
بسیار پوشیده تر است از آتش.

و چهارم آنست که چیزی را بشناسانند بآن
چیز که بوی شناخته شود. چنان که گویند اندر
حدّ آفتاب، که آفتاب آن ستاره است
که بروز برآید. پس آفتاب را بروز شناسانند؛
و نشناید که کسی روز را بشناسد، الّا بآفتاب،
زیرا که بحقیقت روز آن زمان بود که آفتاب
اندر وی برآمده بود. پس چون آفتاب
مشکل بود، روز مشکل بود بلکه مشکل تر بود.

این چهار شرط سخت مهمّ است اندر حد
و رسم کردن، تا غلط نیوفتد.

پدید کردن
معنی نام و کنش و حرف

هر لفظی مفرد یا نام بود یا کنش یا حرف.
و بتازی نام را اسم خوانند. و مر کنش را نحویان
فعل خوانند و منطقیان کلمه خوانند. و اسم و
کلمه هر دو را معنی تمام بود. چنان که اگر کسی
پرسد که که را دیدی؟ گوئی زید را، جواب تمام
بود. و اگر کس پرسد که زید چه کرد؟ گوئی برفت
جواب تمام بود.

د اما حرف را معنی تمام نبود. چنان که اگر
گوید زید کجاست؟ گوئی ب، یا گوئی بر، یا گوئی
اندر، هیچ جواب نبود تا نگوئی بخانه یا اندر مسجد
یا بر بام.

فرق میان اسم و کلمه آنست که، اسم دلیل بود
بر معنی، و دلیل نبود بر کی آن معنی. چنان که مردم
و دستی و روشنی. و اما کلمه دلیل بود بر معنی

[۲۴] وکی آن معنی. چنان که گوئی: بزد ـ که دلیل بود
برزدن، و برآن که اندر زمان گذشته بود. وهم چنان
چون گوئی: بزنند، و همیشه دلیل بود برکسی، که آن
معنی او را بود، چون زننده یا خورنده. ولیکن
آنکس یا آن چیز معیّن نبود که دانی که کدامست.
اگر کسی پرسد که دی، و باز، و باز دینه نامست
یا کلمه؟ جواب آن بود که نامست. پس اگر گوید
که این هر سه دلیل است بر زمان، و باید که کلمه بود.
گوئیم که نه هرچه دلیل بود بر زمان، کلمه بود. که نخست
باید که دلیل بود بر معنی و آنگاه دلیل بود بر زمان
آن معنی. چنان که گوئی بزد، دلیل کنی بر زدن، و
آنگاه بر زمان آن زدن. و گفتار ما که دی
نفس معنیش زمانست، نه چنانست که دلیل بود بر معنی
و آنگاه دلیل بود بر زمانش.
این مقدار که گفته آمد اندر لغظهای مفرد

پسندیده بود.
اکنون اندر لغظهای مرکب سخن باید گفتن.

پدیدا کردن

قضیه که چه بود

ازین لفظهاء مفرد گوناگون ترکیب آید . و از
ایشان مادرا اکنون یکی گونه همی باید . و این آن
گونه است که آنرا قضیه خوانند و خبر خوانند و
سخن جازم خوانند . و این آن بود که چون
بشنوی شاید که گوئی راست است ، و شاید که گوئی
دروغست .

مثال این : اگر کسی گوید : مردم را ثواب و
عقابست ، توانی گفتن که چنین است . و اگر گوید : مردم
پرنده است ، توانی گفتن که نه چنین است .
اگر کسی گوید که هرگاه که آفتاب برآید روز بود
توانی گفتن که چنین است . و اگر گوید : هرگاه که آفتاب
برآید ستارگان پدیدا بود ، توانی گفتن که نه چنین است .
و اگر گوید : شمار یا طاق است یا جفت ، توانی
گفتن که چنین است . و اگر گوید : شمار یا سیاهی بود یا سپیدی

[26] آوائی گفتن که نه چنین است .

و اما اگر کسی گوید : مرا چیزی یا مسئله‌ای بیاموز،
جواب وی بهیچ گونه نبود آن که گوئی چنین است؛
یا نه چنین است . و اگر گوید : با من بمسجد آی ،
جواب وی آن نبود که چنین است و راست گفتی؛
یا نه چنین است و دروغ گفتی .

پیدا کردن قسمت قضیه

قضیه‌ها سه قسم‌اند :
یکی را حملی خوانند . چنان که گوئی مردم
جانورست ، یا مردم نیست جانور .
ویکی را شرطی متصل خوانند . چنان که گوئی :
چون چنین بود، چنان بود؛ و اگر چنین بود،
چنان بود؛ و نه چون چنین بود یا چنان بود، چنین
یا چنان بود .
ویکی را شرطی منفصل خوانند . چنان که گوئی :
یا چنین بود یا چنان بود . یا گوئی نیست که یا چنین بود، یا چنان بود .

پدید اکردن

قضیهٔ حملی و ایجاب و سلب

و کلیت و جزویت و آنچه اندر خور این بود .

خاصیت قضیه حملی آن بود که اندر وی حکم کرده

باشیم که چیزی چیزی است یا چیزی چیزی نیست .

چنان که گوئیم : مردم حیوانست ، یا گوئیم : مردم حیوان

نیست . آنرا که هست گوئیم موجب خوانند . و آنرا

که نیست گوئیم سالب خوانند .

و آن پاره از وی که حکم بروست ، چنان که اندرین

مثال مردم بود موضوع خوانند . و آن پاره ازوی

که حکم بدو بود که هست ، یا نیست ؛ چنان که اندرین

مثال حیوان بود محمول خوانند . و هریکی ازین

دو :ـ

گاهی لفظی مفرد باشند ، چنان که گوئی : مردم حیوان است

و گاهی لفظی مرکب باشند . چنان که گوئی : هرکرا

طعام نگوارد ، معدهٔ ویرا آفتی رسیده باشد . اینجا

[28] جمله گفتهٔ ما که طعامش نگوارد موضوع است. و
جمله گفتهٔ ما که معدهٔ ودا آفتی رسیده باشد
محمول است. ولیکن شاید که لفظی مفرد بدل هریکی
ازین دو جمله نهی، که شاید که آنکس را که طعامش
نگوارد او نام کنی، و آنکس را که معده اش را
آفتی رسیده باشد ب نام کنی. پس آنگاه
گوئی: ا ب است؛ همین معنی دارد، و باشد
که ازین دو یاده یکی مفرد بود دیگری مرکب.
اگر کسی گوید که گفتهٔ ما: زید نابیناست؛ موجب
است یا سالب؟ گوئیم: موجب است، که نابینا بجمله
یکی محمول است، اگر اثبات کنیش قضیه موجب بود، و
اگر نفی کنیش قضیه سالب بود. پس چون گفتیم
نابیناست، بلفظ است اثبات کردیم. پس قضیه
موجب شد. و این را موجبهٔ معدوله خوانند.
و اگر خواهیم که سالبه بود، گوئیم: زید نیست بینا. وفرق
میان این هر دو آنست که اگر زید اندر جهان نبود
شاید که گوئی: زید نیست بینا؛ زیرا که او اندر که زندگی

نیست بینا نبود . و نشاید که گوئی نابیناست، الا آنگاه

که زید بیجای بود .

و اگر پرسند که گفتار ما که زید نیست نابینا، موجب

است یا سالب؟ گوئیم: سالب است؛ زیرا که نابینا

محمول است و لفظ نیست او را نفی کرده است . و

این را سالبهٔ معدوله خوانند .

چون این دانسته آمد، باید که دانسته آید که

موضوع یا لفظی کلّی بود یا لفظی جزوی .

مثال موضوع جزوی آن بود که گوئی: زید دبیرست

یا زید دبیر نیست . و این را مخصوصه خوانند و

شخصیه خوانند . نخستین موجب است و دوم سالب است .

و امّا چون موضوع کلّی بود، از دو بیرون نبود:

یا پیدا نکرده بود که حکم بر چند است؛ بر همه است

یا بر بعضی . چنان که گوئی؛ مردم جنبنده است، و نه گوئی

همه مردم، یا بر بعضی مردم . و این را موجبهٔ مهمله

خوانند . و یا گوئی؛ مردم نیست جنبنده، و این

را سالبهٔ مهمله خوانند .

[30] یا پیدا کرده‌ بود چندی حکم ، واین را

محصوره خوانند . ولفظ پیدا کردن چندی را سور خوانند .

و محصوره چهار گونه است .

یکی آنست که حکم بر همه کرده بود باثبات . چنان که

گوئی : هرچه مردم بود ، حیوان بود ، یا گوئی : هر مردمی

حیوان است ، واین را کلی موجب خوانند ، و

سور وی لفظ هرچه و هر بود .

و دوم آنست که حکم بر همه کرده باشند بسلب

و نفی . چنان که گوئی : هیچ مردم جاویدانه نیست ، و

این را کلی سالب خوانند . و سور وی لفظ هیچ بود .

و سیوم آنست که حکم بر بعضی کرده باشند

باثبات و هستی . چنان که گوئی بعضی مردم دبیرست

و این را جزوی موجب خوانند . و سور وی لفظ بعضی بود .

و چهارم آنست که حکم بر بعضی کرده باشند بنفی

و نیستی . چنان که گوئی نیست بعضی مردم دبیر ، و این

را جزوی سالب خوانند . و سور وی لفظ بعضی بود ،

و ورا سوی دیگرست ، و وی لفظ نه همه است و

[۳۱] اَلفِظ نه هر چه ، و نه هر . زیرا که چون گوئی : نه همهٔ
مردم دبیر است ، یا گوئی که هر چه مردم است دبیر است ،
یا گوئی : نه هر مردمی دبیر است ، حکم نیستی کرده
باشی پس سالب بود ؛ و حکم بر همه نکرده باشی
زیرا که چون گوئی نه همهٔ شاید که برخی بود . پس
این گفتار ما که گفتیم جزوی سالب است .

و حکم مهمل حکم جزوی است زیرا که چون گوئی :
مردم چنین است ، گفتار تو ، مردم ، شاید که همهٔ مردم ،
باشند و شاید که مردمی را باشند که همهٔ مردم مردم
اند و مردمی نیز مردم است . پس برخی مردم
بیقین است و همهٔ مردم بشک .

همچنان که اگر کسی گوید : برخی مردم چنین است ؛
از آنجا واجب نیست که برخی دیگر بخلاف آن بود ،
زیرا که چون همه بود برخی نیز بود . پس حکم بر
برخی باز ندارد که بر دیگر برخ همچنان بود ؛ و
لیکن ببرخی بیقین بود و برهمه بشک . پس پدید
آمد که حکم مهمل همچون حکم جزوی بود .

[۳۲] و پدید آمد که قضیّتهاء حملی هشت‌اند: مخصوصهٔ موجبه، مخصوصهٔ سالبه و مهملهٔ موجبه و مهملهٔ سالبه و چهار محصوره: کلّی موجب و کلّی سالب و جزوی موجب و جزوی سالب. و ازین هشت، مخصوصه اندر علمها بکار نیاید، و مهمله بحکم جزویست؛ بمانند قضیّهاء بکار آمدنی اندر علمها چهار محصوره.

و امّا مهمله هر کجا بکار برد، آید، بجای کلّی غلط افکند، و تشویش، چنان که بجای دیگر پدید کنیم. پس از وی پرهیز باید کردن.

و باید که دانسته آید که حکم هر قضیّه یا هر ینگی باشند، و اجب. چنان که گوئی: مردم جسم است، و این را ضروری خوانند؟ یا نشاید بودن و نا بودن، چنان که گوئی: مردم دبیر است، و این را ممکن خوانند. یا نشاید بودن چنان که گوئی: مردم فرشته است، و این را ممتنع خوانند.

و لفظ ممکن بر دو معنی افتد:

یکی بر نشاید بود و بس، و بجمله بر آنچه ممتنع نبود.

[33] و واجب اندر زیرِ این ممکن افتد، زیرا که واجب
شاید که بود و امّا نشاید که نبود .

و دیگر برنشاید بود، و نابود، و این ممکن حقیقی
است . و واجب در زیر وی نیوفتد . و هر چه
ممکن بود بدین معنی که بِبُود ممکن بود که نبود . و
نه هر چه ممکن بود بمعنی پیشین که بِبُود ، ممکن بود
که نبود .

و این قدر کفایت است اندر نمودنِ حال
قضیّتهاء حملی .

پیدا کردن
حال قضیتهاء شرطی متصل و منفصل هم
بر آن روی که جملی کرده آمد

همچنان که جملی را دو پاده بود، یکی موضوع و یکی
محمول، شرطی نیز دو پاره بود.

اما متصل را دو پاره بود و بس، یکی مقدم و
یکی تالی. و مقدم آن بود که شرط بوی مقرون بود.
و تالی آن بود که جواب بود.

مثال این آنست که چون گوئیم: اگر آفتاب
برآید، روز بود. گفتار ما: آفتاب برآید، مقدم است
و گفتار ما: روز بود، تالی است.

و اما اندر منفصل باشد که یک مقدم را یک تالی
بود، و باشد که تالیها بسیار بود. مثال اول آنست
که گوئی: یا این شمار جفت بود، یا این شمار طاق بود.
نخستین مقدم است و دوم تالی است. و اینجا جز
یکی نبود. و مثال دیگر آنست که گوئی: این شمار یا

[35] هم چند آن شمار بود، یا کم یا بیش، که اینجا یک مقدم را دو تالی است؛ و باشد که بیش از دو بود و باشد که بی کرانه باشد. چنان که گوئی: هر شماری یا دو بود، یا سه، یا چهار، و این را کرانه نیست.

فرق میان مقدم و تالی، و میان موضوع و محمول آنست که موضوع و محمول بجای ایشان لفظی مفرد بایستد، و بجائی مقدم و تالی نه ایستد زیرا که مقدم و تالی هریکی بنفس خویش قضیتی اند. چنان که گوئی: اگر آفتاب بر آید، روز بود؛ گفتار تو: آفتاب بر آید، قضیه است، و گفتار تو: روز بود قضیه است. لیکن لفظ شرط مقدم را از قضیتی ببرد؛ زیرا که چون گوئی: اگر آفتاب بر آید؛ با اندر آمدن لفظ اگر این سخن از قضیتی بشد، تا نه راست است و نه دروغ. و لفظ جواب مر تالی را از قضیتی ببرد، زیرا که چون گوئی: آنگاه روز بود، هم نه راست بود، و نه دروغ. و همچنین اندر منفصل؛ که چون گوئی: این شمار یا طاق است؛ اگر لفظ

[۳٦] یا نبودی این مقدم قضیه بودی . و : یا جفت
است، اگر لفظ یا نبودی این تالی قضیه بودی.
پس این یکی فرقست میان مقدم و تالی،
و میان موضوع و محمول .

و دیگر فرق آنست که آنجا که موضوع و
محمول بود، گوئی که موضوع محمول است، یا نیست .
چنان که گوئی : زید زنده است ، یا نیست؛ و نگوئی،
آنجا که مقدم و تالی بود، که مقدم تالی است یا نیست .
میان مقدم و تالی متصل، و مقدم و تالی منفصل
دو فرق است:

یکی آنست که مقدم متصل نشاید که تالی بود
و تالی که مقدم بود و معنی بجای بود . چنان که
گوئی : اگر آفتاب برآید، روز بود؛ نشاید که حکم
هم این حکم بود و مقدم تالی شود، و تالی مقدم .
و اما اندر منفصل هر کدام که خواهی مقدم کنی و
معنی بجای بود . چنان که اگر خواهی گوئی: شمار یا
جفت بود یا طاق، و اگر خواهی گوئی: شمار یا طاق بود یا جفت.

[37]   و فرق دیگر آنست که تالی مستقل موافق بود با مقدم و دم دار می باشد؛ چنان که روز بودن با آفتاب برآمدن . و اما تالی منفصل مخالف بود و ناسازگار با مقدم؛ چنان که جفت بودن با طاق بودن .

و ازین قبل دراست که اثبات و موجب بودن مستقل آنست که حکم کنی بهستی این سازگاری . چنان که گوئی : اگر آفتاب برآید روز بود . و نفی و سالب بودن مستقل آنست که حکم کنی بنابودن این سازگاری چنان که گوئی؛ نبود ـ که چون آفتاب برآید شب بود .

و باشد که مقدم و تالی سالب بوند و قضیه بنفس خویش موجب بود، چون این سازگاری اثبات کرده باشی . چنان که گوئی : اگر آفتاب برنیاید ، روز نبود . و این از آن قبل موجب است؛ که حکم بهستی و دمداری روز نابودن کرده آمدست مر آفتاب برنا آمدن را .

و مهملی و محصودی مستقل آنست که هرگاه که

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[38] گوئی: اگر، یا، چون آفتاب برآید روز بود، و نه گوئی

که همیشه، و هر باری یا گاهی، این شرطی مهمل بود

اما اگر گوئی: هر باری که آفتاب برآید روز باشد،

موجب کلی بود. یا گوئی: گاه بود که چون آفتاب برآید

ابر بود، این جزوی موجب بود. یا گوئی: هرگز نبود که

چون آفتاب برآید شب بود، این کلی سالب بود. یا گوئی:

نه هرگاه که آفتاب برآید ابر بود، این جزوی سالب بود.

و باشد که قضیّهٔ متصل کلی بود و مردد یاره، وی

جزوی بود. چنان که گوئی که: هر گاه که بر خی مردم

دبیر بوند، بر خی جانور دبیر بوند. و این کلی بود

که گفته‌ای: هر گاه.

اما ایجاب اندر منفصل آن بود که این ناسازگاری

را اثبات کنی. چنان که گوئی یا چنین بود یا چنان بود. و

سلب آن بود که این ناسازگاری را نفی کنی. چنان که گوئی:

نبود شما، یا جفت یا سپید، بلکه یا جفت یا طاق بود.

و کلی آن بود که این ناسازگاری دائم بود. چنان

که گوئی: مدام یا چنین بود یا چنان بود. و جزوی آن

[39] بود که این ناسازگاری گاهی بود، چنان که گوئی:
گاهی بود که مردم یا اندر کشتی بود یا غرقه بود، و این
گاه آنگاه است که اندر دریا بود.

و منفصل بحقیقت آن بود که این ناسازگاری
بود، و لیکن حکم بیرون از آن قسمتهایش نبود، چنان
که گوئی: این شمار یا آن شمار یا برابر بود یا کم یا
بیش.

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ا

پیدا کردن
حال حکمهاء نقیض

نقیض قضیهٔ قضیتی بود مخالف وی بموجبی
و سالبی . اگر وی موجب بود این سالب بود . و
اگر وی سالب بود این موجب بود . و از صورت
خلاف ایشان هر آینه باید که یکی راست بود و
یکی دروغ بود نگاه هر یکی مر دیگری را نقیض بود .
و شرطهاء صورت این خلاف آنست که باید که
معنی موضوع ، و محمول ، و مقدم ، و تالی یکی بود ؛ والا
هر دو مر یکد یگر را نقیض نبوند . چنان که کسی گوید :
بترّه را پدر بود ؛ و دیگری گوید : بترّه را پدر نبود .
یکی بترّه گوسفند خواهند ؛ و یکی برج آسمان خواهند ؛
قولهاء ایشان نقیض یکد یگر نبوند . و این خلاف
از جانب موضوع است .
یا گوید : شکر شیرین است ، و شکر شیرین نیست ؛
یعنی که از شیر کرده نیست ؛ این هر دو راست بوند

[41] و نقیض یکدیگر نبوند. و این خلاف از جانب محمول است. و این حال آشکاره است اینجا، و بسیار جایگاه اندر علمها پوشیده بود و غلط افکند.

و دیگر شرط آنست که باید که اندر همگی و پاره‌گی خلاف نبود. چنانکه کسی گوید: چشم فلان سیاهست، و چشم فلان سپیداست ـ نه سیاه، و بسیاری سیاهی دیده خواهند، و بننی سیاهی هر جایگاه سپیده کی را خواهند.

و دیگر شرط آنست که هر دو حکم یا بقوت بود یا بفعل، نه چنان که کسی گوید: این آتش سوزنده است، یعنی بقوت، و دیگر گوید: نیست سوزنده، یعنی بفعل آنگاه که چیزی را نسوزد. و این هر دو سخن راست بود و نقیض نبوند مر یکدیگر را.

و دیگر آن بود که اضافت اینان هر دو یکی بود. نه چنان که کسی گوید: ده بیشتر است، یعنی از نه، و دیگر گوید: ده بیشتر نیست، یعنی از یازده. این هر دو راست بود و نقیض نبوند.

[42] و دیگر آن که وقت یکی بود، نه دو وقت. و جایگاه یکی بود، نه دو جایگاه. و بجمله حکم هر دو را یکجهت باید. و همان محمول باید و همان موضوع.

و پس، اگر موضوع کلی باشد باید که یکی قضیه کلی بود و یکی جزوی، که شاید که هر دو کلی دروغ بوند. چنان که گوئی: هر مردمی دبیرست؛ و هیچ مردم دبیر نیست، و شاید که هر دو جزوی راست بوند. چنان که گوئی: برخی مردم دبیر است؛ و برخی مردم دبیر نیست. پس نقیض هر چه، نه هر چه بود. و نقیض هیچ، برخی بود.

و چون این شرطها بجا آورده بود، هر آینه یکی راست بود و یکی دروغ بود. و بدین قیاس حال شرطیها بدان.

باز نمودن

حال عکس

حال عکس آن بود که موضوع محمول کنی، و محمول موضوع کنی؛ یا مقدم تالی کنی، و تالی مقدم کنی، و موجبی و سالبی بجای داری و داستی بجائی بود. اما کلی سالب عکس پذیرد، و هم کلی سالب باز آید. که هرگاه که راست بود که هیچ فلان باستار نیست، راست بود که هیچ باستار فلان نیست. و الا نقیض وی راست بود که بعضی از باستار فلان است؛ آن بعض هر آینه چیزی بود بهمان بادا. پس بهمان آن باستاری بود که فلان است؛ و وی بعینه همان فلان بود، و هم باستار. پس فلانی هست که وی باستار بود. و گفته بودیم که حق است که هیچ فلان باستار نیست؛ و این محال است. پس پدید آمد که چون هیچ فلان باستار نبود، هیچ باستار فلان نبود.

[۴۴] و اما کلی موجب، واجب نیاید که هر آینه
عکس وی کلی موجب بود. که توان گفتن که هر مردمی
حیوانست، و نتوانی گفتن که هر حیوانی مردم است.
و لیکن واجب آید اورا عکس جزوی موجب؛
زیرا که هر گاه که همهٔ فلانان باستاد بوند؛ باید که
برخی باستادان فلان بوند؛ و الا هیچ باستاد فلان
نبود. و واجب آید؛ چنان که پدید کرده شند که
هیچ فلان باستاد نبود؛ و گفته ایم که هر
فلانی باستاد است.

و جزوی موجب عکس آن، جزو وی موجب
بود؛ چنان که گوئی: برخی فلانان باستاد بوند؛ باید
که برخی باستادان فلان بوند بهمان جت که گفتیم.
و اما جزوی سالب؛ واجب نیاید که اورا
عکس بود؛ زیرا که توانی گفتن که نه هر حیوانی مردمست؛
و نتوانی گفتن که نه هر مردمی حیوانست.

در شناختن قیاس

بهر ناانسته‌ای راهیست که بوی دانسته شود.

اما اندر رسیدن را و تقدم کردن را دا را هدست

ورسم، و این هردو را یاد کردیم. و اما گرویدن را

و تصدیق کردن را دا را به حجت است.

و حجت سه گونه است: قیاس، و استقرا، و مثال.

اما دلیل بردن از شاهد به غایب هم از جمله مثال است.

و معتمد ازین هر سه قیاس است، و از جمله قیاسها

قیاس برهانی. و تا اندانیم که قیاس به جمله چه بود نتوانیم

دانستن که قیاس برهانی چه بود.

و قیاس به جمله سخنی بود اندر وی سخنانی گفته، که

چون پذیرفته آید سخنانی که اندر وی گفته آمده بود،

از آنجا گفتاری دیگر لازم آید هر آینه.

مثال این است که اگر کسی گوید: هر جسمی مصور

است و هر مصوری محدث است؛ این سخن قیاس

بود زیرا که هر گاه که این هردو قضیه پذیرفته آید

[46] و تسلیم کرده شود، از اینجا سخنی دیگر لازم آید که

هر جسمی محدث است.

و همچنان اگر کسی گوید: اگر عالم مصوّر
است، پس عالم محدث است، و لیکن عالم
مصوّر است. این نیز قیاس بود زیرا که این سخن
است مؤلف از دو قضیه که هرگاه که هر دو پذیرفته
آید، سخنی سوّم لازم آید جز از این هر دو، هر چه
که پارهٔ یکی از ایشان است. و این سخن آنست که:
عالم محدث است.

و قیاس دو گونه است، یکی را اقترانی
خوانند و یکی را استثنائی.

پدید آکردن

قیاس اقترانی

قیاس اقترانی آن بود که دو قضیه را گرد آورند
و هر دو را اندر یک پاره انبازی بود و بدیگر پاره
جدائی. پس از ایشان واجب آید قضیه دیگر که از آن
دو پاره بود که اندر ایشان انبازی نبود.
مثال این آن که گفتیم که هرگاه که تسلیم کرده آید
که: هر جسمی مصوّدست، و هر مصوّدی محدث است؛
از اینجا لازم آید که: هر جسمی محدث است.
پس اینجا دو قضیه است:
یکی آن که، هر جسمی مصوّدست.
و دیگر آن که هر مصوّدی محدث است.
و مقدمهٔ پیشین را یک جزو جسم است، و دیگر
جزو مصوّر. و مقدمهٔ دوّم را یک جزو مصوّدست
و دیگر جزو محدث. پس مصوّد جزو هر دو است،
و لیکن یکی را جسم تنهاست و یکی را محدث. و این

[48] قضیه که لازم آمد یک جزو ش جسم است و دیگر
جزو و محدث .

وگردش کار بدین سه پاره است، بهر جسم، و
محقر و محدث، و ایشان را حد خوانند . پس
محقر را و هرچه بدی ماند حد میانگین خوانند،
و جسم را که موضوع شود اندر آنچه لازم آید
حد کهین خوانند، و محدث را که محمول شود اندر
آنچه لازم آید حد مهین خوانند.

و آن دو قضیه را که اندر قیاس است مقدمه
خوانند. و آن قضیه را که لازم آید نتیجه خوانند.
و آنرا که موضوع نتیجه اندر وی بود مقدمهٔ کهین
خوانند، و آنرا که محمول نتیجه اندر وی بود مقدمهٔ
مهین خوانند. وگرد آمدن این دو مقدمه را اقتران
خوانند. و صورت گرد آمدن را شکل خوانند.

و این صورت سه گونه بود :

یا حد میانگین محمول بود اندر یک مقدمه، و
موضوع اندر دیگر، و این را شکل نخستین خوانند.

[49] یا اندر هر دو محمول بود، و این را شکل دوم خوانند

یا اندر هر دو موضوع بود، و این را شکل سوم خوانند

و حکم مقدّم و تالی از متّصل همچنین است که

حکم موضوع و محمول حملی است .

و از دو سالب قیاس نیاید، و از دو جزوی

قیاس نیاید، و هرگاه که صغری سالب بود و

کبری‌ش   جزوی   بود قیاس نیاید . پس هر

شکلی را خصوصیتها هست .

قیاسهاء شکل اوّل

شکل اوّل را دو فضیلت است :

یکی آن که قیاسهای اورا، حجّتی نباید که دست

کنند که قیاس اند ؛ و نه چنین است حال دو شکل دیگر و

آن که هر چهار محصوره دارد که کلّی موجب است و کلّی سالب

و جزوی موجب ، و جزوی سالب اندر وی نتیجه نیاید که

و اندر شکل دوّم هیچ نتیجه موجب نبود ، و اندر شکل

سوّم هیچ نتیجه کلّی نبود ، چنان که پیدا شود .

[50] و مدّ قیاس شدن اقتران انتفاء شکل نخستین را دو
شرط است : یکی آنست که صغرا اشان باید که موجب بود
و دیگر آنست که کبرا اشان باید که کلّی بود . و اگر چنین
نبود شاید که مقدّما مهاء راست بوند و نتیجه دروغ بود .
و هرچه نتیجه وی راست نبود علی کلّ حال چون
مقدّما تنش راست بوند آن قیاس نبود .

پس چون شرط این دو شرط است قیاسهاء
این شکل چهار بوند .

قیاس نخستین
از دو کلّی موجب .

مثال وی آنکه اگر کسی گوید : هر فلانی باستا داست
و هر باستاری بهمان است ؛ از اینجا نتیجه آید که : هر
فلانی بهمان است . چنان که گویی : هر جسمی مصّورست ،
و هر مصّوری محدث است ؛ از اینجا نتیجه آید که : هر
جسمی محدث است . و این نتیجه کلّی موجب است .

[51]

قیاس دوم.

از دو کلّی و لیکن کبری سالب.

چنان که کسی گوید: هر فلانی باستار است، و هیچ
باستار بهمان نبود. نتیجه آید که: هیچ فلان بهمان
نبود. چنان که گوئی: هر جسمی محدّد است، و هیچ
محدّد قدیم نیست. از اینجا لازم آید که: هیچ جسم
قدیم نیست. و این نتیجهٔ کلّی سالب است.

قیاس سیوم.

از صغری موجب جزوی، و کبری موجب کلّی.

چنان که کسی گوید: برخی گوهرها نفس است، و هر
نفسی صورت علم پذیرد؛ پس برخی گوهرها صورت
علم پذیرد. و این نتیجه جزوی موجب است.

قیاس چهارم.

از صغری موجب جزوی، و کبری سالب کلّی.

چنان که کسی گوید: برخی گوهرها نفس است، و هیچ

[۵۲] نفس جسم نیست . پس؛ برخی گوهرها جسم نیست .

و قیاسهاء متصلات هم برین سان بوند .

قیاسهاء شکل دوم

شرط دردستی قیاس شکل دوم آنست که یکی مقدمه موجب بود ویکی سالب ، و مقدمهٔ کبری بهرحال کلی بود پس قیاسهای وی چهار بود .

نخستین

از دو کلی وکبری سالب .

چنان که گوئی : هر فلانی باستاد است ، و هیچ بهمان باستاد نیست ؛ از اینجا نتیجه آید که هیچ فلان بهمان نیست .

برهان آن : که چون گفتار ماکه هیچ بهمان باستاد نیست ، حق است ، پس عکس وی که هیچ باستاد بهمان نیست ، حق بود ؛ چنان که گفته آمد است اندر باب عکس . پس چون گوئیم که : هر فلانی باستاد است ، و هیچ باستاد بهمان نیست ؛ این نتیجه درست بود

که: [53] هیچ فلان بهمان نیست .

دوم

از دو کلّی و صغری سالب .

چنان که گوئی: هیچ فلان باستار نیست، و هر بهمانی
باستادست؛ نتیجه آید که: هیچ فلان بهمان نیست . زیرا
که چون صغری را عکس کنی، و مقدمتین را تبدیل کنی
چنین شود که: هر بهمانی باستار است، و هیچ باستار فلان
نیست . نتیجه آید که: هیچ بهمان فلان نیست . و این
نتیجه عکس پذیرد، و نتیجه پیشین شود، که: هیچ فلان
بهمان نیست .

سیوم

از جز وی موجب صغری، و کلّی سالب کبری .

چنان که گوئی: برخی فلانان باستادند، و هیچ
بهمان باستار نیست . نتیجه آید که: برخی فلانان بهمان
نه اند؛ زیرا که کبری عکس پذیرد و آنگاه بیچهارم

[۵۴] قیاس شکل اول دسد و هم این نتیجه آرد .

چهارم

از جزوی سالب صغری وکلّی موجب کبری .

چنان که گوئی : نه هر فلانی باستادست ، و هر بهمانی باستادست ؛ نتیجه آید که : نه هر فلانی بهمان است .

و این نتیجه آمدن را براه عکس نشا ید ددست کردن زیرا که صغری جزوی سالب است و عکس نپذیرد ، و کبری کلّی موجب است و عکس وی جزوی بود ؛ و چون عکس ویرا با صغری گرد آوری دوجزوی بوند و از دو جزوی قیاس نیاید . پس مر پدید کردن نتیجه آوردن وی را دو تدبیر است ، یکی را اقتراض گویند ویکی را خلف .

اما درا اقتراض آنست که چون گفتی : برخی فلان باستاد نیست ، آن برخی لا محاله چیزی بود ، آن چیز آن باد ا . پس گوئیم : هیچ آن باستاد نیست ، و هر بهمانی باستاد است ؛ نتیجه آید که : هیچ

[55] آن بهمان نیست. چون این دردست شد گوئیم: برخی
فلان آن است، و هیچ آن بهمان نیست. پس
از این قول دردست شد که: نه هر فلان بهمان است.
و اما راه خلف آنست که گوئی، اگر گفتار ما که:
برخی فلان بهمان نیست، دروغ است؛ پس باید که،
هر فلانی بهمان است. و گفتیم که: هر بهمانی باستادست،
پس باید که: هر فلان باستار بود. و گفته بودیم که: نه هر
فلانی باستاداست، این محال است. پس نتیجه ما دردست
است .

قیاسهاء شکل سیوم

شرط قیاسهاء این شکل آنست که صغری موجب
بود هر آینه ولیکی مقدمه هرکدام که بود کلّی بود. پس
قیاسهاء این شکل ششش بوند.

نخستین
از دو کلّی موجب

[56] چنان که گوئی: هر باستادی فلان است، و هر
باستادی بهمان است؛ نتیجه آید که: برخی فلان
بهمان بود؛ زیرا که چون صغری را عکس کنی چنین شود
که: برخی فلان باستار بود، و هر باستادی بهمان بود؛
و بقیاس سیوم از شکل اول بازگردد و این
نتیجه آید.

دوم

از دو کلی، و کبری سالب.

چنان که گوئی: هر باستادی فلان است، و هیچ باستار
بهمان نیست؛ نتیجه آید که: نه هر فلانی بهمان است؛
زیرا که چون صغری را عکس کنی بچهارم قیاس
شکل نخستین شود.

سیوم

از دو موجب و صغری جزوی
چنان که گوئی: برخی باستادان فلان اند، و هر

[56] چنان که گوئی: هر باستادی فلان است، و هر باستادی بهمان است؛ نتیجه آید که: برخی فلان بهمان بود؛ زیرا که چون صغری را عکس کنی چنین شود که: برخی فلان باستار بود، و هر باستادی بهمان بود؛ و بقیاس سیوم از شکل اقل باز گردد و این نتیجه آید.

دوم

از دو کلی، و کبری سالب.

چنان که گوئی: هر باستادی فلان است، و هیچ باستار بهمان نیست؛ نتیجه آید که: نه هر فلانی بهمان است؛ زیرا که چون صغری را عکس کنی بچهارم قیاس شکل نخستین شود.

سیوم

از دو موجب و صغری جزوی
چنان که گوئی: برخی باستادان فلان اند، و هر

[۵۷] باستادی بهمان است؛ نتیجه آید که : برخی فلانان بهمان اند؛ زیرا که چون صغری را عکس کنی ، بسیوم شکل نخستین شود .

چهارم

از دو موجب و کبری جزوی .

چنان که گوئی : هر باستادی فلانست ، و برخی باستادان بهمانند؛ نتیجه آید که : برخی فلانان بهمان اند؛ زیرا که چون کبری را عکس کنی و گوئی : برخی بهمانان باستاد اند ، و هر باستادی فلان است ؛ نتیجه آید که : برخی بهمانان فلان اند . و آنگاه عکس وی دست آید که : برخی فلانان بهمان اند .

پنجم

صغری کلی موجب و کبری جزوی سالب .

چنان که گوئی : هر باستادی فلان است ، و نه هر باستادی بهمان است ؛ نتیجه آید که :

[58] نه هر فلانی بهمان است . و این را بعکس نشاید
پدید اکردن، همچنان که آن دیگر را گفتیم ؛ ولیکن با فتراض
شاید کردن، و بخلف .

اما افتراض چنان بود که، آن باستار که
بهمان نیست، آن باد، تا هیچ آن بهمان نبود: پس
گوئیم که: هر باستاری فلانست، و برخی باستار آنست؛
نتیجه آید که: برخی فلان آن است . آنگاه گوئیم که:
هیچ آن بهمان نیست ؛ نتیجه آید که: برخی فلان
بهمان نیست .

و اما طریق خلف آنست که اگر گفتار ما که:
نه هر فلانی بهمان است ؛ دروغ است، پس: هر
فلانی بهمان است ؛ چون گوئیم که: هر باستاری
فلانست، و هر فلانی بهمان ست ؛ نتیجه آید که: هر
باستاری بهمان است . و گفته بودیم که: نه هر باستاری
بهمان ست، و این محال است، پس آن نتیجه که آمد
درست است .

ششم

از صغری موجب جزوی و کبری سالب کلّی

چنان که گوئی: برخی باستان فلان است، و

هیچ باستان بهمان نیست؛ نتیجه آید که: هر فلانی

بهمان نیست. زیرا که چون صغری را عکس کنی

بیمحکادم شکل اول شود.

و همچنین نیز دو شکل دیگر بود در مستقلات

را که بدل موضوع و محمول مقدّم و تالی کنی.

قیاسهاء استثنائی
از متصلات

قیاسهاء استثنائی از متصلات از متصلی آید
و استثنائی . چنان که گوئی : اگر مر فلان را تب دارد،
رگ وی تیز بود؛ و این متصل است . و باز گوئی:
و لیکن تب دارد فلان را؛ و این استثناست . از اینجا
نتیجه آید که : فلان را رگ تیز بود .

و این قیاسها دو گونه بود .

یکی آن بود که استثنا عین مقدم بود، و نتیجه آرد
عین تالی را . چنان که گفتیم .

و دیگر آن بود که استثنا نقیض تالی بود . چنان که
گوئی باین مثال : و لیکن رگ وی تیز نیست؛ نتیجه
آرد نقیض مقدم را که پس فلان را تب نیست . و
اگر استثنا کنی نقیض مقدم را،که گوئی و فلان را تب
ندارد؛ نتیجه نیاید که رگ فلان را تیزست یا نیست .
و هم چنان اگر استثنا عین تالی کنی ، چنان که گوئی:

[61]و لیکن رگ وی تیز است، نتیجه نیاید که تب

دارد ش یا ندارد ش.

قیاسهاء استثنائی [62]

از منفصلات

اگر منفصل از دو جزو بود و استثنا کنی از عین هر کدام که باشد نتیجه آورد نقیض دوتم را. چنان که گوئی: این شمار یا جفت بود، یا طاق؛ لیکن جفت است؛ پس گوئی: طاق نیست. و لیکن طاق است؛ پس گوئی: جفت نیست. و اما اگر استثنا نقیض هر کدام که باشد نتیجه آورد عین دیگرم. چنان که گوئی؛ لیکن طاق نیست، پس جفت است؛ لیکن جفت نیست پس طاق ست. و این حکم اندر منفصلات حقیقی بود، و اندر نا حقیقی حکم باشد که نه چنین بود.

و اما اگر منفصل را جزو ها بیش از دو بود، عین هر کدام که استثنا کنی آن جمله باقی را بر گیرد. چنان که گوئی: این شمار یا افزونست یا کم، یا برابر؛ و لیکن این شمار افزونست؛ نتیجه آید که: پس برابر و کم نیست. و نقیض هر کدام که استثنا کنی نتیجه باقی بود همچنان که

[63] بود تا آنگاه که یکی ماند. چنان که گوئی؛ ولیکن افزون نیست؛ نتیجه آید که: یا برابرست یا کم.

قیاسهاء مرکب

نه همه نتیجها از یکی قیاس بیاید یا دو مقدمه بس باشد، بلکه بود که یکی مسئله بقیاسهاء بسیار درست شود. چنان که از دو مقدمه نتیجهء آرند، باز از آن نتیجه مقدمه شود قیاس دیگر را و هم چنان همی شود تا آخرین نتیجه مسئله بود.

و نه همه قیاسها را بهترین ترتیب آرا ستـه گویند، ولیکن بسیار بود که بعضی مقدمها را بیفکند مر اختصار را یا مر حیله را؛ و بسیار بود که مقدمها را تقدیم و تأخیر کنند. و لیکن بحقیقت آخر بدین قیاسها آید که ما گفتیم. و این سخن را مثالی آوریم از علم هندسه، و این مثال شکل نخستین بادا از کتاب اقلیدس.

با ما خطیست نشان وی ا ب بادا، و همی خواهیم که بهترین خط بر بهرهان شکلی سه سو، که ا و را مثلث خوانند که هر پهلوی از وی چند یکدیگر بود.

[65] دعوی کنیم و گوئیم که هرگاه که نقطه ا را مرکز

پرکار کنیم و تا نقطه ب بگشائیم و دائره کنیم گرد

او، باز بیائیم و نقطه ب را مرکز کنیم و بدودی

نقطه ا دائره کنیم گرد ب یک مر دیگر را لامحاله

برند. بر بریده نگاه نقطه ج علامت کنیم، و از آن

خطی راست به ا آوریم و خطی راست به ب .

پس گوئیم که این شکل که اندر میان نقطهاء ا ب ج

است مثلثی است هر سه پهلو برابر.

برهان این آنست که دو خط ا ب و ا ج

برابر اند زیراکه از مرکز بمحیط آمده اند، و همچنین

ب ا و ب ج برابر اند؛ و دو خط ا ج و ب ج

برابر اند زیراکه هریکی برابر خط ا ب اند. پس بر

خط ا ب مثلثی کردیم که هر سه پهلو او برابر اند. پس

اندر سخن قیاس چنین بکار برند. و چنین بود که من

خواهم گفتن. اینجا چهار قیاس است همه از شکل اول.

نخستین اینست : دو خط ا ب و ا ج دو خط راست

اند که از مرکز بمحیط آمدند، و هر دو خطی راست که از

[۶۶] مرکز بمحیط آیند برابر بوند. نتیجه آید که دو خط ا ب و ا ج برابر اند.

و دیگرم، همچنین مر دو خط ب ا و ب ج دا.

و سیّوم: دو خط ا ج و ب ج ، دو خط اند که برابر یک خط ا ب اند؛ و هر دو خطّی که برابر یک خطّی بوند، هر دو برابر بوند. نتیجه آید که: دو خط ا ج و ب ج برابر اند.

و چهارم: شکل ا ب ج ، که بر خط ا ب هست بگرد وی سه خط برابر است د هر چه بگرد وی سه خط برابر بوند وی مثلّثی بود هر سه پهلوش برابر. نتیجه آید که شکل ا ب ج که بر خط ا ب هست مثلّثی است هر سه پهلوش برابر.

و باید که دیگر مسئلها بر این قیاس کرده آید.

قیاس خلف

از جملهٔ قیاسهاء مرکب قیاسی است که او را قیاس خلف خوانند.

[۶۷]‏ و فرق میان و پیشین که او را قیاس راست و قیاس مستقیم خوانند آنست که قیاس خلف دعوی را راست کند بدان که خلاف او را باطل کند . و خلاف او را بدان باطل کند که از وی محال لازم آورد، و هر چه از وی محال لازم آید محال بود . زیرا که چون محال نبود، هرگز آن که از محال چاره‌اش نیست نبود .

و این قیاس خلف مرکب است از دو قیاس : یکی قیاسی است از جمله قیاسهاء اقترانی که من بیرون آورده‌ام .

و یکی قیاس استثنائی . مثال این آن که کسی درست خواهد کردن که هر فلانی باستاده است گوید : اگر نه هر فلانی باستاده، و دانسته‌ایم هر بهمانی باستاده است که این مثلاً بی‌شک است، از اینجا واجب آید که نه هر فلانی بهمانست ؛ و لیکن این محال است که خصم مقر بود مثلاً، که این محال است پس گفتار ما که هر فلانی باستاده است حق بود .

و مردمان اندر باز بردن این سخن بقیاسهای

[68] دردست کاری دراز پیش گرفته اند و خود نهاده اند.

و ارسطاطالیس اشارت بدین کرده است که من خواهم گفتن. ولیکن این مقدار گفتست که: خلف از شرطی است. پس پدید کردن آن که: خلف از شرطی است؛ این است که من خواهم گفتن.

نخستین قیاس از اقترانی متصل است، و حملی، چنین که: اگر گفتار ما که هر فلانی باستادست دروغست؛ پس نه هر فلانی باستادست راست است. و هر بهمانی باتفاق باستادست. نتیجه آید شرطی که: اگر همهٔ فلان باستادست دروغست، پس نه هر فلانی بهمانست. و باز این نتیجه را مقدمه کند و گوید: اگر همهٔ فلان باستادست دروغست، پس نه هر فلانی بهمانست؛ لیکن هر فلانی بهمانست باتفاق؛ و این استثناست. نتیجه آید که هر فلانی باستادست دروغ نیست، پس حق است.

و اگر کسی خود نقیض نتیجهٔ قیاس اول بگیرد، که بدرستی وی اتفاق است و اورا بآن مقدمهٔ حق که اتفاق است ترکیب کند، خود بی خلف نتیجه آیدراست.

[69] بجنان که گوید: هر فلانی بهمانست، و هر بهمانی باستادست،
بس هر فلانی باستادست .

ولیکن اندر میان سخن بسیار جا یگاه بود
که خلف اندر خود تر بود، وسخن کوتاه تر شود .

APPARATUS

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٤   باشد [نخست [A, B, P //

٦   که بدان [که بآن A //

۸   وگاه [وگاه [B //

۱۰   گونه (اند) B / بپرسی [بپرسند B, P //

۱٥   چه [این [A /(چیزی) A //

۱٦   ماهو [ماهر A //

[16]

1   بپرسی [که] A //

2   اندر [ذات] B / (اندر خود پیش جواب آن بود چنانکه بپرسی) A //

4   ای شنئی [ ] هونی جو هره [A //

5   گو بیند (و) B //

6   گویند [که] B / بدو بار نیمه [بدد نیمه باز / A / بدو (بار) B //

7   ای شنئی [نی جو هره [A //

9   اما (آن) B //

10   خاص نز [بود [A, B //

11   گوهر [جوهر A / و حیوان] که [A, B, P //

12   عام نز است (از مردم و خاص نز است) B //

13   شما [که] B //

16   کلی عامتر [کلی کامنز A, کلی خاصنز B //

17   (بجنس خاصنز بود) B / خاصنز بود (و طدرچه
کلی خاصنز بود) B //

[17]

1   و چیزی بود که [وجنس چیزی بود که B/ هم [هم] بهم B//

6   بس [پس A //

7   (سیاهی) A ، B //

13   چیزها [چیزهائی A //

15   سیاهی [زراع B/ هرچند (که) B //

17   (زراع) A //

[18]

1   چنزویما [چنزیتها A/ چنزویماکه [واندر A، B/ یک [یکی A //

2   دارند [دارد A/ جدائی [بودن B //

4   بمسر [پس A //

7   زبر [زبیر A، B //

10   (بود) A //

11   هریک [هریک A، B //

13   یکی (را) A //

15   این را [اورا B //

[19]

2   جنان که [چون A / جنبنده [جنبیدن B //

[20]

5   بچیز [بچیزی A //

6   ذات وی [ذات وهی A //

7   وصفها، [وصفهائی A, B //

10   بیادی [ببادی A //

15   گریان (و) A, B, P, < د > //

16   که (از قرب وی اندر خویشتن شناندزه آید) A //

[21]

1   خویشتن [هست P, < د > ، [هشت] A //

3   معنی (افتند اما آن معنی) B /

4   چیزی [د] A //

5   نشناخته بچیزی کنی [بچیزی کنی A, P //

6   نبود (اندر تعترف تو مر) A, P, < د، خ ه > //

7   (از او) A, P //

8   (و) B //

9   جینز [جیری A، B //

10   اندر (حِدّ) P //

12   مشکل بود [هم] A، B، P / مدّت (نیز) B، P //

13   بیرسپیدن (دی) B //

17   سپیدی است [سفیدیست //

[22]

1   گویند (که) A / سپیدی [سپید A //

8   بشناسند [بشناسانند A، B //

9   جیز که [جز [B / شنود [نشود B //

10   که آفتاب [که او A، (آ فتاب) B / است [ایست A //

14   پس [هنوز آفتاب مشکل است [B //

17   نیوفتند [نیو فتند B //

[23]

8   بود (دو) B //

10   (دو) B / (اگر) A //

11   بیر یا گوئی [بیر با کو B //

15   کی [کئی P / چنان که [گوئی P، < دو > //

16 (و دِ رُستنی) A / (و دوِشِنی) B، P، ‹کب،
سں، خال› //

[24]

1 کی ‹ کئی P / بَنْد ‹ زد› A //

2 اندر ‹ د ر A //

5 یا آن ‹ بیان B / دانی (د کہ) B //

11 دلیل (دکنی) A ؛ ‹ بود› B / زدن ‹ کہ] B //

[25]

6 جازم ‹ جِزم B، A //

9 مثال ایں ‹ مثال آن P، ‹کب› / گوِیِد ‹ کہ] A /
ثواب ‹ ثوابست B //

12 اگر ‹ و اگر B، P / گوِیِد کہ] B //

13 و اگر گوِیِد ‹ و اگر کسی گوِیِد B / ہرگاہ کہ) A //

15 شما د ‹ شما دا B //

16 تگنن (د کہ) A //

[26]

1 (کہ) B //

4   بمسجد B // بمسجدی [E بمسجد

8   قضیه بر A // قضیه ها [E قضیه بر

12   چنان P, ‹ن› // ‹ن› چنان [E چنین/ ‹ط› چنین P, ‹ن›

13/14   یا چنان بود چنین // یا چنان بود [E بچنین بود چون بچنان

بود بچنان بود B //

15   ویکی را [E وسبوم را B / شرطی منفصل [E شرطیه

منفصل B //

[27]

3   (وکلیت) B / (و جزویت) B / اندر [E در B //

4   حملی [E حملیه B //

8   (گو نمیم) A //

10   (و) B //

15   گوئی [که] A //

16   ویرا [E اودا B / باشد [که] B, A [P, B /

اینجا [E آنجا B, P ‹کب›, ‹کب, ھھ, ط, د, آ, ط› //

1 (که طعامش نگوارد موضوع است) A //

2 ودرا [اودرا B / باشد] که [A //

3 (ولیکن شاید که لفظی مفرد بدل هر یکی) B //

4 (از بین دو جمله نفی که شاید) B / آنکس را (که) A //

5 و آنکس (را) B //

6 ب [ست B //

9 گوید (که) P , < آرد رکب > / گفتار ما [که] P , A /

نا بیناست] یا نه بخانه است [A , B , P //

11 موجب [بموجب B //

17 آنرا (که) B / زندگی [زید که B //

1 (که) A //

3 (و) A , B //

8 لفظی کلّی [لفظ کلّی A , B / لفظی جزوی [لفظ جزئی A //

9 جزوی [جزئی A / (بود) B , P , < رکب > //

14 جنان که [، همنانکه B //

16 خواند] و این دو گونه بود موجه چنانکه گوئی مردم جنبنده است و سالبه چنانکه گوئی C B/ گوئی (مردم) B/ نیست جنبنده C جنبنده نیست B//

[30]

1 (و لفظ پیید اکردن چندی را سور خواند) B//

4 یکی [که] A//

8 دوم C دیگر P، <در،کب> //

10 وی [و C B//

14 باشد C باشند A، B//

16 لفظا [نیست C A، B، P //

17 ودا[وی C A/ سوری C سور A/ دیگرست C دیگر هست A//

[31]

2 یا گوئی نه هرچه مردم است دبیر است C یا نه هر مردمی دبیر است B//

3 یا گوئی نه هر مردمی دبیر است C یا گوئی نه هرچه مردم است دبیر است B//

4 کرده باشی C کرده باشیم زبانشی A//

5   برخی (بود) B //

7   جزوی] جزئی A //

9   باشند] باشند A، B، P، ﴿م، ک، ه، ط ﴾ //

12   گوید] که B [//

13   بخلاف] خلاف B //

14   برخ] برخی که A //

16   بیقین] یقین P، ﴿د، کب، ن ﴾ //

17   همچون] همچو B / جزوی] جزئی A //

[32]

1   (و) B / قضیتها] قضیهای A، B / حملی] حملیه B //

2   موجبه] و] B //

3   موجب (و) A / جزوی] جزئی A //

4   جزوی] جزئی A //

6   قضیهای] قضیهای A / علمها] عملها A / محصوره] است] A //

7   هر کجا] هر جا B //

9   ازوی] از و A / بپرهیز] بپرهیز P //

10 ‏(دو باید) B //

11 ‏آینگی باشد و واجب] و انجیکی واجب باشد // A

17 ‏شنایید بود] و این را امکانِ عام گویند یعنی سلب
‏ضرورتن از یک طرف بود] بود // B

2 ‏شنا باید که بود] ناشناباید بود P ، < د، خال، کب > /
‏شنا باید (که) B / (انّما نشاباید که) P ، < د، خال، کب > //

6 ‏ب بود] بود // A

8 ‏(فقد) // A

9 ‏قضیتها ع] قضیتهای B ، A //

2 ‏قضیتها ع] قضیتهای B ، A //

3 ‏که] آن P ، ز] از] B ، آمد] آمد A //

4 ‏حملی] حملیه B //

5 ‏شرطی] در] B ، A //

10 ‏گفتا دما] اگر] P //

گفتنذ ما] که [P, > کہ, م > //   11

این] آن P, > د, ط, کب, ل, ن, ہ > //   16

[35]

مقدم (د ۱) B,] است و [B / (بود) B //   2

بجهاید] بود [B //   4

خویش] خود A //   8

بر آید (روز بود گفتند نو) B //   9

(آفتاب بر آید) B //   10

(اگر لفظ) A //   17

[36]

(این مقدم تطبیه بودی و یا جفت) ہ //   1

(است اگر لفظ با نبودی) B //   2

(و دیگر فرق آنست که موضوع و) A //   5

آنست که] گوئی P, > ہ > / (آنجا که موضوع و) A /
آنجا (که) B //

(محمول) A / (گوئی) P, A > خ ل کب ن) //   6

زید] مردم B //   7

8   آنجا که مقدم و تالی بود که مقدم [و] B //

9   میان مقدم و تالی [بود] A / متصل و [میان] B //

12   تالی (که) A / مقدم بود (و) A / چنانکه [اگر] A //

13   گوئی (اگر) A / روز بود [و] B / شاید که حکم [کنی] A //

16   چنانکه اگر خواهی (گوئی) B //

[37]

2   دم دار [دم دار] P, B ؛ و دوم دار A //

8   بر آید [بر آمد] A / و سالب [و سلب A سلب B //

12   سازگاری [دار] A, B //

14   غبل [دار] B //

15   آمدنت [آمده است] A, B //

[38]

3   اما اگر گوئی هر باری (که آفتاب بر آید روز باشتی) A, B, P, ‹ن› //

4   (گاه) P, ‹خیال کب، د› (بود) / A, B, P, ‹د› //

6   بر آید (شب بود) B //

گوئی دکنه) A ، P ، <دهر ، کب> //   9

کلی [درا] A ؛] از آن قبل درا[A،B ، P //   10

که د این ناساز گاری) B //   12

(درا) A،B //   13

(که) B //   17

[39]

مردم (دبا) B //   2

گوئی [دکه] (این شما د با آن شما) P ، <د ، کب ، ظا> //   6

[40]

(حال) B ، P ، <کب> //   2

از [آن] A //

دروغ د بود (B) (دهر) A،B،P ، <ل> / <ل>   7

هر (دیکی) P ، <م ، ک ، ه ، کب ، د ، خ ، ه ، ن> /

دیگری [دیگر A ، P ، <د ، خ ، ه ، ن> / بود[بوند P <ن> //

شرطها [شرطهائی B //   8

گوید [دکه] B ، P ، <کب> //   10

دیگری [دیگر B / دیگرا گوید که B //   11

12 آسمان [آسمانی B //

13 نبوند [نبود B،A //

15 گوید [گویند A [کہ] A،B،P، <ن> //

16 از شیر [از شیره A / نبوند [نبود A //

[41]

4 پادشاہگی [بارگی A، بیادگی P //

5 کسی گوید [گویند A،B،P <ن> <

9 و دیگر شرط [و شرط دیگر A / آنست (کہ) B /

بقوت [بقوة B //

10 کہ [اگر A [/ گوید [کہ] B //

11 بقوت [بقوة B / گوید [این B / نیست (سوزنده) A //

12 نسوزند (و) B //

14 یکی [گونہ] B //

15 گوید [کہ] B،P //

16 دیگر (گوید) B //

17 بود [بوند B /) و نقشین نبوند A،P <د،کب> //

2   درا] از P,B، <دهد، کب>//

3   یکجهت] یکجهته B / (محمول) B//

5   جزوی] جزئی A//

گوئی (بر خی مردم دبیراست) A//

(و) B//

بجا] بجائی P,B//

1   باز نمودن] پدید کردن A؛ پیدا کردن B//

2   حال عکس] عکس حال B//

3   و محمول] مر / A

4   با مقدم] مر / A/ و نالی] یا نالی A/ نالی] مر / A//

6   پذیرد (و) A / کلی] بکلی A,B//

7   آید (که) A؛ B,A [و] A//

11   باستادی] باستاد A / بود (که) A//

12   بعینه (همان) B؛ (فلان بود) A//

[44]

1   (و)B //

3   صدر حیوانی [صدر حیوان B //

4   جزوی [جزئی A //

5   غلامان [غلان B //

6   هیج [همیج B //

8   گفته ایم (که) A

10   و [و] B / جزوی [جزئی A / آن جزوی [او جزئی A //

13   جزوی [جزئی A //

13/14   که اورا عکس بود [که عکس اورا بود A //

[45]

3   [و] B //

4   گرویدن (درا) B //

8   است (و) P، دقن< //

9   بود (نتوانیم) B

10   ) دانستن که تیاس برهانی به بود) B //

11   بود [که] A [گفته] شود [A، B //

14   /B,A/ (نه) این/مثال < ن > P, B, A (است)

      /A [نه] گوید//

16   هرگاه (نه) B //

[46]

4   (پس عالم محدث است ولیکن عالم) B //

5   (معدود است) B //

6   هرگاه (نه) B //

7   سوم [سیوم A, B / جز (ازین) A //

[47]

3   [اما] B //

4   بدیگر (باره) B //

7   هرگاه (نه) A //

8   معدودی [معدد B //

12   معدودی [معدد B //

13   را [نه] A / و دیگر [وبک A //

14   (مقدمه دوم را) A //

[48]

1 آمد [آمد آ A ، آمد که B / دیگر که یک A,B,P ، آن) //

5 میانگین [میانگی B / خوانند] و B [

12 خوانند (و آندرآنکه محمول نتیجه اندروی بود مقدم) A //

13 (همین خوانند) A

[49]

2 بود (و) A,B / سوم [سبیوم A,B //

5 از [هر B [P ، < م ، ک ، ن ، ط ، آخ ط > /

جنزدی [جنزی A //

7 کبریتش [کبرک B / جنزدی [جنزئ A //

8 شکلی [شکل B / خصوصیتها دست [خاصیتها دست A //

9 ضیاسپا [ضیاسپائی A,B //

12 اند [آید A,B

14 جنزدی موجب [جنزی است A / جنزدی ساب [جنزی A //

15 موجب [کلی A //

16 سوم [سبیم A، سبیوم B ، (هیچ) B / که [خود B //

[50]

1 ‫(و) B / شدن] از [B / افتتراها ء [افتترانی کفائ A //‬

2 ‫آنست که [دد] A / صغرا [صغری B,A //‬

3 ‫و دیگر [دیگر A / اکبرا [کبری B,A / یقینین [یقینی A //‬

4 ‫بود [نبود A //‬

5 ‫(بود) B / هر (چه) B //‬

6 ‫نبود [نبوند P، <کب، د> //‬

7 ‫تنها سمهاء [تنها سمهائ A //‬

10 ‫(از) B //‬

11 ‫گوید [که] B, P، <د> //‬

12 ‫نتیجه] هر [B //‬

13 ‫فلانی [فلان B //‬

[51]

2 ‫از] از [B //‬

3 ‫چنانکه کسی گوید [چنانکه گوئی A //‬

5 ‫چنان که (گوئی) A //‬

8 ‫سیوم [سیم A / جزوی [جزی A //‬

جزوگی [جزری A // 12

جزروی [جبری A //

بیرخی [بعضی A / P, A است (و) B //

[52]

بوند [بود A , P 2

(برهان ان که جون جون گفتار ماکه هیچ بهمان) A // 11

(باستار نیست حق است پس عکس وی که هیچ باستار) A // 12

(بهمان نیست) A // 13

(باب) B // 14

[53]

[و] B // 2

(و) B // 3

مرهمانی [بهمان A , B // 4

آید [آمد A // 5

بهمان [فلان A / فلان [بهمان A // 8

جزوی [جزری A // 12

باستارند [باستارانند B, P , دهم، ار، کب، د، آ < ت // 13

14   مولانا نان بهمان که فلان فلانه بهمان A، P //

15   // P، A (نه)

[54]

1   (قیاس) A، B، P، <کب، ط،> /رسد [خود A، B، P،
<کب، ط،/ هم [بربن] B [صبیح A //

3   جزوی [جزی A //

4   نه هر فلانی [برخی فلان B/ باستایت [باستانیت B//

5   آید که نه هر فلانی [آید برخی فلان B //

6   (عکس نشاید درست کردن) B //

7   (زیرا که صغری جزوی سالب است) B/ جزوک [جزیی A//

8   جزوی [جزی A //

9   جزوی [جزی A، (دو جزوی) B //

10   جزوی [جزی A //

14   برخی [ر] B //

[55]

1   چون (این) B //

2   فلان د آن) B/ فلان آن است [آنست A //

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3 / ‹د› ، P ، A نه همه [نه همه [نه همهٔ /

// ‹ د ، کب › ، P بود [است /

5 // B [است] بهمان .

13 // A بود [بوند

15 // B بود [موجب

[56]

2 // P ، B ، A [رز [برخی

/ ‹ د ، هم ، کب › P ، B ، A فلانان ‹ فلانان

4 // ‹ هم › P ، B ، A بوند [بود

10 // B نه هر فلان [نه هر فلانی [نه هر فلانی

11 // ‹ کب › ، P ، B ، A (قیاس)

[57]

1 // A برخ [برخی

4 // B [و [

5 // A جزوی [جزوی

6 // B [نه [لوئی

11 // P ، A بود [آید

13 صغری [صغریش A, B, P / <د، س> / بود] A, B, P /

کبری [کبریش A, B, P / <د، س> / جزوی [جزی A //

[58]

2 ببید آکردن [ببید کردن A, (ببید ا) B /

دیگردا [که] A [//

4 با ستار (که) B //

7 نلاون د آن) B / گو بیئم (که) B //

8 آید [آمد A, B //

15 (و) P, <کب، د، ظ> / آمد [آید B //

[59]

2 جزوی [جزی A //

4 نلاون [نلاون A, B //

6 اول [پیشین A, B, P, <ن> //

8 موضوع ومحمول [محمول و موضوع B //

[60]

3 (بیاسکها، استثنائی از منتعلات از منتقلی آید) B //

4 (و استثنای) B / گوئی [که] B / مر [مرد B (م) A /

4 (تب دارد) B//

5 (رگ وی تیز بود و این شغل است و باز گوئی) B//

6 (و لیکن) B/ (فلان را) A

11 استثناء [استثنائی B

14 استثنا[استثنائی B/ نقیض]مهر[B//

15 که [اگر B/ (در ا) A، B، P <ده> //

16 استثنا [استثنائی B//

[62]

2 استثنائی (از منفصلات) B//

4 آورد]و[B//

7 استثنا [استثنائی B//

8 آورد[آرد B//

11 (و اندر ناحقینی حکم باشند که نه چنین بود) A//

15 آید[آمد A//

[63]

2 آید (که) B//

2 (نه) A / بیایید] بایید B //

3 (بلکه) B //

4 چنان که [گوئی] B / باز آن نتیجه مقدمه] مقدم B //

5 قیاسی] قیاس A //

8 بعضی] بعض B, (بعضی) A //

9 حیله] حیلت A //

11 مثالی] مثال B / آوریم] آوردیم B, A //

15 خواهیم] خواهم A / ببرهان] برهان B, A / سه سو] سه سه بسو B, سه گوشه A //

16 (که) A / خداوند] خوانیم B / پهلوی] پهلو B / وی] هم A //

1 نقطه] ها B ( ) A, B / (ها) A //

2 پرگار] بپکار A / کنیم (و) B //

3 ب ها] ب مها A //

6 خطی راست] خط A /

بہ ا آوریم و[ ] بیاوریم بہ A/ آوریم و او[ ]A//

7   شکل (کہ) B//

8   (مدر) B//

9   ب ا[ ]اب B//

10   همچنین [ ]دو خط[A,B,P//

11   اچ (دوہب ج) B//

12   (برابراند) B//

13   ..هلو او[ ]چهلوی A، (او) B//

[66]

3   دیگرم[ ]و دیگرهم B/ همچنین مر[همچنین مر/ B

ب ا و ب ج[اب ج و ب B/(دا) B//

4   سیّوم [کہ] A,B,P [ل،کب>//

5   یک [ ]دیگرند یعنی برابر[A,B//

6   بوند [برابر[B/کہ[ ]هر[A//

7   ب ج[اج A,B,P>ل، ن>//

9   است[ ]بوند A,B//

10   بود[ ]مر[B//

12   است] مر [B //

16   خوانند [گویند A //

[67]

1   فرق [فوق A //

7   (است) B //

8   امتزاجی [غریب [A، B، P، <ن> //

10   که کسی [کسی که B //

11   گوید [که [B / (گوید اگر نه هر نلانی) A //

12   (باستادست و) A / دانسته ایم [که [A //

13   بی شک [بلی شک [A / آید که (نه) B //

[68]

3   لیکن [او [A //

4   (آن) A //

6   قیاس (از) B //

10   (ابن) P //

12   مقدمه [مقدم A //

15   A (و) / A (قیاس اول) B ، P ، ⟨ن⟩ //

// ⟨د ، ل⟩ ، P ، B ، A [کہ] گوید //

TRANSLATION

In the name of God, the beneficent and merciful.   [1]

All praises and thanks are due to God, the creator, and

the giver of wisdom. And blessings on His prophet, Muhammad

Mustafa, and on his family members and companions.   5

[There came to me] the order of my exalted master, the

victorious and just king, Adhuddin 'Ala-al Dawlah, who is aided

by God and who is the pride of the faithful and the crown of

the religious leaders, Abu Jafar Muhammad bin Doshmanziar, the

master and the leader of the faithful. May his life be long and

destiny victorious, and may his kingdom be increased [from day   10

to day].

[His order] came to me, his slave and servant of his court,

[I] who have found in his service all the fulfillment of my

objectives by way of security, greatness, dignity, sufficiency,

pursuit of knowledge, and [the very] nearness [of the king

himself]. [His order is] that it is necessary that I, one of

the servants of his court, write in Parsi Darri a book in

which I bring together the principles and fine points of five

sciences   from the sciences of wisdom of the ancients in a   15

simple and condensed form.

First, logic, [as] that science is the measure [of all

other sciences].

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Second, natural science, which is the science concerning those things which can be touched, seen, or moved and changed.[109]   [2]

Third, the science of astronomy which deals with the origin of the world, and the conditions and the manner of the movement of the heavens and stars; as [both] are open to observation, and so it is befitting to know their [true] nature.

Fourth, the science of music which discloses the causes   5
of harmony and disharmony in voices and [also discloses] the origin of tones.

Fifth, the science of those things that are beyond the science of natural things.

And [this] has been decided [by me], that when logic has been completed, then [the following] strategy [as conducive to the better presentation of the sciences under consideration] has been brought about: [namely,] that a beginning has been made with those sciences which are at the higher level,[110] [proceeding]   10
whereafter gradually to those sciences which are lower down, contrary to that which is the usage and the custom. Therefore, if there was no guidance [available] as to the assignment of a science [to] a place [in this scheme], then [it is] taken as one of the lower sciences.

Thus I, a servant [of the king], even though I did not consider myself worthy of these sciences and [moreover] viewed   15
[them to be] above my capacity and ability, thought [nevertheless] that when I obey my benefactor and carry out his order, then by [some] good fortune [my] obedience might result in   [3]
success. And [so], relying on my creator, I occupied myself with carrying out the order [of the king].

[WHEREIN] THE PURPOSES AND THE ADVANTAGES OF LOGIC   [4]

ARE MADE CLEAR

Knowing is of two kinds:

The first is through concepts, a [process] which is called

tasawwur in Arabic. For instance, if somebody says, "man,"

"fairy," or "angel," or anything similar to this, you under-

stand and you can conceive and realize what he intends by   5

those words.

The second is knowing by judging [or verifying]. For

example, you judge [and verify whether or not] this is a fairy,

or that some man is under the orders [of somebody], or anything

similar to this. This [process] is known as tasdīq[111] in Arabic.

Both of these [ways of knowing occur] in two manners:

One is that [a thing] may be conceived by thought and for   10

the conception of which there is no other way except reasoning;

for example, to comprehend what the soul is and form a concep-

tion of it and to judge the immortality of the soul and to

verify it.

The other is that we conceive a thing about which we judge:

not through argumentative thinking and summoning it from the

intellect, but by way of a priori knowledge. Thus, we know   15

that whatever things are equal to one [and the same] thing,

then however many they may be, each one of them will also be equal to one another.

Or [we may know things] through the senses: for instance, that the sun is bright.

Or we may accept things from the great and wise people, [5] such as experts on Islamic law [and those who are] religious leaders.

Or it may be something on which [all] people agree and we may have been brought up [believing in those things], for example, [when] we say, "Lying is bad," or "One should not be 5 cruel." Or [it may rest] on those other similar things that come latest to the memory.

And before any [unknown] thing is conceived or verified by reasoning, it is necessary that we know something else, so that we [may] know the unknown through the known.

An example of this in the area of concepts is that if it 10 is not known to us what man is and somebody [by way of] disclosing [this] to us says, "A man is an animal who speaks," [then] it is necessary that we should first have known the meaning of "animal" and the meaning of "speaker" and have conceived of these, and [it is only] afterwards then that we might [come to] 15 know that which was not known to us about the meaning of man.

And an example of this in the area of reasoning and verification is that, if it is not known to us that the world is originated[112] and somebody [by way of] disclosing [this] to us [6] says, "The world is formed and whatever is formed is originated,"

[then] it is necessary that we should have [accepted it as] verified
and [hence] known[113] that the world is formed, and also [accepted
it as] verified and [hence] known that whatever is formed is originated,
[it is only] afterwards then that we come to know that which
we did not know, [which in the present example is] about the   5
world's originated mode.

Thus, whatever we do not know but want to know by means of
some [other] thing, [then] we know [now] that [that other thing]
should be known to us first. And [so] whatever was not known
to us becomes known by [means of] the known.

But it is not the case that every known leads us to the
knowledge of every unknown. [A known can lead us to the knowl-   10
edge of an unknown only when] the unknown is commensurate [with
the known] so that it [might be] possible to know [the unknown]
through it; and [also when] there is a method such that by that
method it is possible to get from the known to the unknown till
it [too] becomes known.

The science of logic is that science in which the conditions
of knowing the unknown through the known are made explicit:
[namely,] what it is which is true and what it is which is [only]   15
near the truth and what it is which is false. Each of these
[three] is of several kinds.

The science of logic is a balanced science while the other
sciences are sciences [which have] either gain or loss.

Man's salvation is [concomitant] with the purity of his   [7]
soul. And the purity of the soul [depends] on the accomplish-
ment of worths in its existence and keeping away from the

corrupting of [one's] nature. And the way to both [the accomplishment of worths and the prevention of corruption] is through knowledge. And any [purported] knowledge which has not been weighed in the balance [of logic] has no certitude, hence, in reality is not knowledge [at all]. Therefore, there is no escape from learning logic. 5

This science of the ancients has one [peculiar] characteristic, [which is,] that the student of this [science] in the beginning of [his] work does not know what the advantage is in that which he is learning, until suddenly in the end he comes to know and understand [both] its advantage and its purpose. 10

It is therefore necessary that the reader of this book not become disheartened by hearing things which do not manifest their usefulness immediately.

THE BEGINNING OF THE SCIENCE OF LOGIC   [8]

[SECTION I]

[CHAPTER I]

THE EXPLANATION OF THAT WHICH IN TERMS AND IDEAS IS   [9]

CALLED SIMPLE

Simple and compound terms:

It is necessary that it be known that terms[114] are of two

kinds. One is called <u>simple</u>; for instance, you say, "Zayd" or

"Muhammad," or, for instance, you say, "man" or "wise." The   5

other is called <u>compound</u> or compiled; for instance, you say,

"The man is learned" or "the wise man." And not until the

nature of simple words becomes known can the nature of com-

pound words become known.

Clarification of [the classification of] terms as general

and singular:

Every simple term is either general or singular.   10

A <u>general term</u> is that which in the same sense is equally

applicable to many things. For example, you [might] say, "man,"

in that [the term] man in one and the same sense is applicable

[equally] to [persons named] Zayd, 'Amar, and Bakr. If it is

that [in a given case] the term was applied only to one thing,

then you may be able to imagine such that you apply it to many   15

things. That [is] by imagination you are able to think [of] many [10]

things belonging to that concept.

Thus, you are able to think of many suns and many moons [to which the term sun and the term moon will respectively apply; although as a matter of common practice these terms are in fact applied each to one thing respectively].

A <u>singular term</u> is that [of which] it is impossible that it apply to [any] except [exactly] one thing in one [and the same] meaning. [That is,] you cannot in the same meaning apply [that word] to other things. For example, when you say [the proper name] Zayd,[then] the meaning of "Zayd" is not [anything else] except [that particular person called] Zayd. Thus, if you call some other thing Zayd [also], then you call it [that] with a different meaning, not with the same meaning [as in the first case].

The learned are not occupied with the nature of singular terms and singular concepts, rather their occupation is with general concepts. And there is no doubt that **every general** [term or concept] subsumes [some] singular [terms and concepts].

Exposition of general-essential and general-accidental:

[A] general in relation to its singulars is either essential or accidental.

The [<u>general-] essential [term]</u> is such that when you know its meaning and [also] the meaning of the singular [it subsumes], [then] you would necessarily know three cases:

First, you would know that that [general] is the meaning of that singular. For instance, when you know what "animal" is and what "man" is, or you know what "number" is and what "four" is, [then] it is impossible that you not know that man is [an]

5

10

15

[11]

animal, and similarly it is also impossible that you not know

that four is a number. But if, as substitutions for "animal"

and "number," you posit "exist" and "white," [then] it is   5

possible that you not know that man exists or four exists, or

man is white, or [man] is not [white].

The second is that you should know that it is necessary

[that a thing] be first [subsumable under] that concept which

is [general-] essential before [the thing can] be [subsumed

under] that concept which is singular. For example, it is   10

necessary that a thing first be an animal before it [can] be

a man, and it is necessary that [a thing] first be a number

before it [can] be four, and it is necessary that [a thing

first] be a man before it [can] be Zayd.

Third is that you should know that no [external] thing

has given that particular that [essential] meaning, rather it

is that in itself. For example, you know with correctness   15

that no thing renders a man an animal, and [no thing] renders

four a number [in that man in himself is an animal, and four

in itself is a number]. And if this were not [the case], then

a man could be a non-animal, and similarly four could be a   [12]

non-number, which is impossible.

The meaning of our saying that something renders [another]

thing thus and so is, that the thing [in question] by and in

itself was not thus and so, but something else has externally

rendered it thus and so. But if it is not possible that a   5

thing [in] itself be [anything] except thus and so, then no thing

has rendered it so.

Certainly that thing which renders [a thing] a man also
renders [that thing] an animal, but it does not render man an
animal, in that man [in] himself is an animal and four [in]
itself is a number, and blackness [in] itself is a color. This   10
[however] is not so [for example with] man's whiteness, in
that there is something [not pertaining to man as man] which
renders a man white, [whether it be] in his [physical or
physiological] nature or external to his nature. Nor is it so
[with] man's existence, in that something [else] is necessary
to give man existence.

Thus, every concept which has [met] these three conditions
is _essential_, and anything which has not [met] even one of   15
these three conditions is _accidental_.

The _accidental_ is that [of which] it is not possible that
it ever [occurs] separated, even in the imagination, from the   [13]
thing [to which it belongs]. For example, evenness [is not
separable] from a thousand. Or, for example, [a geometrical
figure's] three angles being [equal] only to two right angles
from [its] being a triangle.

A triangle's three angles together equaling only two right
angles will be explained later.[115] [Also] the ability to laugh
by nature, for example, [is not separable] from man. But these
[and others like them] are characteristics which are anterior
to the reality [or essence] of the thing.   5

It is necessary that [in order] to explain [the foregoing]
we also say this: Man has two characteristics, one [of which

he has] more intimately than the other. The first is essential

and the second is accidental.

[The first is] <u>rationality</u>. The explication of this is

that he has a rational soul, the soul from which come [his

ability] to speak, [his power of] discernment, and [other]   10

characteristics peculiar to humans.

The second is <u>risibility</u>. The explication of this is that

in his nature [he is] such that when he sees or hears a surpris-

ing [or a] strange thing he is surprised. And if [the thing]

is not contrary to [his] nature he may [possibly] laugh. But

prior to these two characteristics, it is necessary that first   15

there exist a soul in order that there be a man. When this

soul has become coupled with the body and man has [really]

become man, then risibility and the ability to be astonished

come.

Thus, the posterior characteristic comes [only] after   [14]

man has [really] become man.

[While] of [the characteristic] previous to this, [namely,

of rationality,] it may be said that it is necessary first that

a man have [the] human soul so that he becomes [in the real

sense] a man in order that he may laugh by nature. But it is

not possible to say that it is necessary first that he become

[capable of] laughing by nature in order to have [the] human   5

soul and become [truly] a man.

Thus, the former characteristic, [namely, rationality,]

is truly essential, and the second characteristic, notwithstand-

ing [the fact] it is never apart from man, is not essential

[but] accidental.

But [when] you say that Zayd is sitting, or is sleeping,   10

or is old, or is young, [then] there is no doubt that [these

are all] accidental; notwithstanding that one [of these may]

quickly disappear, and one long endure.

[WHEREIN ARE] DESCRIBED GENUS, SPECIES, DIFFERENTIA,   [15]

PROPERTY AND ACCIDENT

There are five [kinds] of general terms: three [general-]

essential and two [general-] accidental.

The [general-] essentials [themselves] are of two types:

One is this: when with respect to things, you ask, "What   5

are they?" then by that question you want [to find out] the

reality of the concept of those [things], [and] the answer [to

this question] is given [by] a [general-] essential term. For

example, when you ask, "What are man, cow, and horse?" then

the answer is given that they are animals. And if you ask,

"What is blackness [or] whiteness [or] redness?" the answer is   10

given that they are colors. [Again,] if you ask, "What are ten,

and five, and three?" the answer is given that they are numbers.

Similarly, if it is asked, "What are Zayd, and 'Amar, and Khalid?"

the answer is given that they are men.

Thus, "animal," "color," "number," and "man" [are] in reply   15

to the question, [as to] what [concept] do these things [viz.,

man, cow, and horse; blackness, whiteness, and redness; ten, five,

and three; Zayd, 'Amar, and Khalid respectively] fall under.

In Arabic ["animal," "color," "number," and "man"] are [each]

called the answer to mā-huwa.[116] [And whatever term is   [16]

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general-essential and is the answer to the question "what

things?" is _genus_].

The other is this: when you inquire as to [what] kind

[of thing] anyone [of the above things] is in itself [or in its

essence, then] the answer [to that query] is this other general-

essential term. For example, [suppose] you ask, "What kind of

animal is man?" [and] they say "rational;" then "a rational" is

the answer to [the question] "What kind is it?" [as applied]

to [the animal] man. In Arabic [this is] called the answer

to _ayyu shayy'in_.[117]

Again, for example, we [may] ask, "What kind of number is   5

four?" and [in answer] they [will say] that [it is such that]

by being halved twice it reduces to one.

And whatever is a general-essential term and is the answer

to "What kind of thing is it?" is known as __differentia__.

[Note,] however, that general-essential term which is

in answer to the question "What is it?" [may be] more general   10

[compared to one general-essential term] and more particular

[compared to another general- essential term]. For instance,

"body" is more general than "animal" but more particular than

"substance." And "animal" is more general than "man" but more

particular than "body." Similarly, for example, number is

more particular than "quantity" but more general than "even

number." While "even number" is more particular than "number"

and more general than "four," but "four" is more particular   15

than "even number," however, it is more general than this par-

ticular or that particular [instance of] four. So, whichever

[of two] general [-essential terms] is more general is the
genus [of that which is] more particular [than it]. And which-
ever general [-essential term] is more particular [of the two]
is the species of [that which is] more general.

Also there are things which are both genus and species.   [17]
And there are things that are genus only without being a species
under anything [at all]; for instance, "substance" and "quantity"
in the examples [we have given].

Also there are things that are species only and genus of
no species at all. [This is] for the reason that under these   5
there are no general-essential terms answering to [the question]
"What is it?"; instead, under these [terms] there are particulars
only, for example, "man" and "four." [Or] for example, "black-
ness," in that [one instance of] blackness does not, in [its
own] nature, have that separateness from another [instance of]
blackness which one color [has] from [a different] color. [This   10
is] for the reason that color from color has that separateness
which blackness [has] from whiteness; [that is to say that]
they have opposition in terms of essential properties. An
[instance of] blackness does not have separation from another
[instance of] blackness in [terms of] substance or property,
but [the separateness is rather] due to external circumstances.
[So,] for example, one [instance of blackness might] be the
blackness of a crow, and the other, the blackness of an ink.
But the crow and ink are things [that are] external to the
nature of blackness [itself]. And [while] the presence of
blackness in the crow is the condition of [the crow's being]   15

black, [it is still] not essential [to the crow]; even though

at present, [in a given case, the blackness] is not possible

[in fact] to be separated from the crow; nevertheless, in

imagination, it is possible [to see] that that blackness [may]

be in something else and not be in the crow at all.

In fine, all those particulars which are under one [and   [18]

the same] species have separation one from the other in [virtue

of] accidental things. [Thus] Zayd is different from 'Amar

in that Zayd is taller or fairer or older [than 'Amar], or is

someone else's son, or from another town. And all [of] these   5

characteristics are accidental.

Thus it is [now] manifest that there is a species which

cannot become a genus; and this is called the species of

species,[118] meaning the species of all species that are above

it.

It is therefore clear that a general-essential [term] is

either genus or species or differentia. But a general-   10

accidental [term] either [belongs] to [only] one universal [or

class], as, for example, "risibility" to man--[in which case]

it is called property--or the universals [or classes to which

it belongs] are more than one, as, for example, "ability to

move"--which [belongs] both to man as well as to other things--

and "blackness"--which [belongs] to crows as well as to other   15

things. [In these latter cases the general-accidental terms]

are known as common accidents.

Thus, every general term is either a genus, such as "animal,"

or it is species, such as "man," [a species] of animal, or it is

a differentia, such as "rational," or it is a property, such as   [19]

"risible," or it is a common accident, such as "moving [thing]"

or "white" or "black."

[WHEREIN ARE] TO BE FOUND THE CONDITIONS OF DEFINITION   [20]

AND DESCRIPTION

The purpose in a definition is to know the true nature of

a thing, and [when this is done] the thing's differentiation

[from others] naturally follows [by] itself [so that one need

not enumerate these].

The purpose in a description is to give a note of a thing,   5

even though its essence is not truly known, and giving notes [of

a thing] is itself to differentiate it [from other things].

Thus, definition is composed of essential characteristics

of a thing.

To define is this: you take the proximate genus of the

thing, for example, "animal" of man. After that, you bring the   10

essential difference [of that thing], thus "rational" [for the

present example, and] so you say, "Man is a rational animal."

This then is the definition of man. Similarly [in the defini-

tion of four] you say, "Four is a number which, by being halved

twice, reduces to one."

And a description is [formed] like this: you say that "Man

is a smiling, weeping, [and] wide-nailed animal." Or,   15

"Four is a number such that when it is multiplied by itself,

sixteen results." Or, "[Four] is a number which results when   [21]

two is multiplied by itself."

It is imperative that four kinds of mistakes not be com-

mitted in definition and description. All four [of these]

happen to fall [under this] one [general] notion; [namely,]

it is necessary [with regard to] anything which is not known

and [which] you wish [to] know, that you [attempt to] know   5

it by means of a thing which is better known than that [which

you wish to know], otherwise there will be no gain at all in

your seeking knowledge of it.

The four circumstances which explicate [the aforementioned

general] notion [are these]:

The [first] is [when] we [attempt to] make [something]

known [by means of a definition, which is given] in terms of

[the thing] itself. For instance, in the definition of time,   10

we [might] say that "Time is the period of movement." [Now,]

period and time are the same things; [thus, for] the person to

whom the definition of time is a problem, the definition of

period is also a problem. And to ask him "What is time?" is to

ask him "What is period?"

The [second] is [when] we [try to] make one thing known   15

[by means of a definition] in terms of another thing which

[itself] also is like [the thing being defined] in obscurity

or in obviousness. For example, we say that "Blackness is

that color which is the opposite of whiteness." But this is   [22]

no better than saying that "Whiteness is that color which is

opposite of blackness," in that [both] blackness and whiteness

occupy the same position in [respect of their] obscurity or obviousness.

The third is [when] we [try to] make a thing known [by means of a definition] in terms of a thing [even] more obscure   5
than that thing [being defined]. For example, we [might] in the definition of fire say that "It is that body which resembles the soul." But soul is much more obscure than fire.[119]

The fourth is [when] we [try to] make a thing known by [defining it in terms of] that thing which is [itself] known through it. For example, we [might] in the definition of sun   10
say that "The sun is that star which comes out in the day." So we [are trying to] make the sun known in terms of day. However, it is impossible that someone know [what a] day [is] except through the sun, for the reason that in reality day is that time in which the sun is risen. Thus, if it is a problem [for some-one to know what] the sun [is], it is [also] a problem [for him   15
to know what] a day [is]; indeed, even more so.[120]

[It is] extremely important [to observe] these four condi-tions in formulating definitions and descriptions so that they do not fall into error.

[WHEREIN ARE] MADE MANIFEST THE MEANING OF NOUN, VERB,   [23]

AND PARTICLE

Every uncombined word is either a noun or a verb or a

particle.

In Arabic noun is known as <u>ism</u>. The verb is called <u>fi'l</u>

by the grammarians while the logicians call it <u>kalima</u>.   5

The sense[121] of both nouns and verbs [by themselves] is

complete. For example, if somebody asks, "Whom did you see?"

And you say, "Zayd," then, this is a complete answer. [Again]

if somebody asks, "What did Zayd do?" and you say, "He left,"

then, this is a complete answer.

But a particle [in itself] does not have a complete sense.   10

For example, if [somebody] asks, "Where is Zayd?" and you say,

"by" or "on," or you say, "in," then it is not a complete answer

unless you say, "by the house," or "in the mosque," or "on the

roof."

The difference between noun and verb is that the noun is

a token[122] of a thing but not an indication of the whenness[123]   15

of that thing, for instance, "man" or "correctness" or "light."

A verb on the other hand indicates a sense [as well as] the   [24]

whenness of that sense. For example, [when] you say, "He struck,"

[then this] indicates [both the act of] beating, and that it

was [done] in the time passed. Similarly, when you say, "He

may strike," then [this] always indicates someone [or something]

such that the sense, [namely, the act of beating,] is [in refer-

ence to] it, for instance, a striker or a reptile. But that   5

person or that thing is not determined [by the phrase itself]

that you know who or what it is.

And if somebody asks [whether] "yester-" [day, year, etc.]

and "past," "last," and "old" are nouns or verbs, then the

answer is that they are nouns. After [this] if he says that all

these three are indications[124] of temporality and therefore it

is necessary that they be verbs, [then] we say that not every-

thing which [is an] indication of temporality is a verb, in

that it is necessary, first [of all,] that it indicate an   10

idea,[125] and then afterwards indicate a time [with respect to]

that idea. For example, when you say, "He struck" you indicate

[first the idea of] striking and then you indicate the time of

that striking. And [so] our saying that the sense of "yester-"

is essentially temporal is not [the same as saying] that [first]

there is an indication of an idea and afterwards an indication

of its time.

And this much that has been said [in Section I] in [regard   15

to] simple words [and terms] was choice. Now it is necessary

to discourse in [the subject] of compound terms.

[SECTION II]

[CHAPTER V]

[WHEREIN ONE IS] TO FIND WHAT [A] PROPOSITION IS.   [25]

Various [kinds of] combinations result from simple terms.

For us at present, one kind from these [various kinds of combina-

tions] is of continuous necessity. And this is the kind which   5

is called a proposition or a report or a judgmental discourse.

And this [kind] is [such] that when you hear it, you may [properly]

say [of it that] it is true, or [else that] it is false.

[Some] examples [that clarify this point]:

If someone says, "For man there is [divine] reward as well

as [divine] punishment," then it is possible to say, "It is so."   10

And if he says, "Man is a winged animal," then it is possible

to say, "It is not so."

If someone says, "Whenever the sun comes out it is day,"

then it is possible to say, "It is so." And if he says, "When-

ever the sun comes out the stars become visible," then it is

possible to say, "It is not so."

If [someone] says, "Numbers are either odd or even," then   15

it is possible to say, "It is so." And if he says, "Numbers

are either black or white," then it is possible to say, "It   [26]

is not so."

However, if someone says, "Instruct me [in] something or

some problem," then in no way will it be [an] answer to him

[if] you say, "It is so" or [else] "It is not so." And if

he says, "Come with me to the mosque," the answer to him is   5

is neither "It is so and you are telling the truth" nor "It is

not so and you are telling a falsehood."

[DESCRIPTION OF] THE [VARIOUS] KINDS OF PROPOSITIONS

There are three kinds of propositions:

One [kind of proposition] is called predicative [proposi-

tion]. For example, you say, "Man is an animal" or [you say,]   10

"Man is not an animal."

Another [kind] is called conjunctive conditional [propo-

sition]. For example, you say, "Since this is so, that is so,"

or [you say,] "If this is so, then that is so," or [you say,]

"It is not the case that since this is so then this or that is

so."

[Still] another [kind] is called disjunctive conditional   15

[proposition]. For example, you say, "Either this is so or

that is so," or you say, "It is not the case that either this

is so or that is so."

[A fuller discussion of the different kinds of propositions

mentioned above is in the next two chapters.]

[WHEREIN ARE] MADE MANIFEST PREDICATIVE PROPOSITIONS   [27]

AND THEIR AFFIRMATIVITY, NEGATIVITY, UNIVERSALITY,

AND PARTICULARITY AND WHATEVER [ELSE] IS PERTINENT

TO THESE

The [distinguishing] characteristic of predicative propo-

sitions is that in these [propositions] we have judged either   5

that a thing is a something or [we have judged that] a thing

is not a something. For example, we say, "Man is an animal,"

or we say, "Man is not an animal." That proposition in which

we say, "is" is called affirmative, and that in which we say,

"is not" is called negative. And that part of [the proposition]

about which the judgment [is made], for instance, "man" in the

above examples, is called the <u>subject</u> [of the predicative pro-   10

position]. And that part of [the proposition] which is judged

as either "is" or "is not" [of the subject], for instance,

"animal" in the above examples, is called the <u>predicate</u> [of the

predicative proposition].

Each one of these two, [namely, the subject and the predicate,]

may sometimes be a simple term. For example, "Man is an

animal" [where both "man" and "animal" are simple terms].

Sometimes [each of the subject and predicate] may be com-   15
pound terms. For example, "Whosoever does not digest his food,
his stomach will be disturbed." Here our entire utterance,   [28]
"whosoever does not digest his food," is the subject, and our
entire utterance, "His stomach will be disturbed," is the pre-
dicate; [in this case both the subject and predicate are com-
pound terms]. However, you may put [two different] simple
[or single] words[126] [each as] a substitute for each of these
two phrases. That is, you may designate as A the person who   5
does not digest his food and designate as B the person whose
stomach will be disturbed. So, then you say, "A is B." This
has the same meaning [as the original proposition]. It may
[also] be [the case in a proposition] that of [its two] parts
one be [a] simple [term] and the other [a] compound [term].

If someone asks whether our utterance, "Zayd is non-seeing,"
is affirmative or negative, [then] we reply that it is affirma-   10
tive. [This is] because "non-seeing" as a whole is one [single]
predicate. If you affirm it [of a subject] then the [resulting]
proposition is affirmative, but if you deny it [of a subject]
then the [resulting] proposition is negative. Therefore, since
we said "is non-seeing," we affirmed it by [virtue of] the
word "is," hence, the proposition ["Zayd is non-seeing"] becomes
affirmative. [A proposition such as] this is called a distorted
affirmative proposition.[127]

If we want the proposition to be negative, we say, "Zayd   15
is not capable of seeing." The difference between these two,
[namely, "Zayd is non-seeing" and "Zayd is not capable of seeing"]

is that if Zayd does not exist in the world, then you may

[quite properly] say, "Zayd is not capable of seeing," for

the reason that anyone who is not alive is [certainly] not   [29]

capable of seeing. But you may not say that [Zayd] is non-

seeing except until Zayd exists. And if asked whether our

utterance "Zayd is not non-seeing" is affirmative or negative,

we answer that it is negative, for the reason that "non-seeing"

is the predicate and the words "is not" have negated it. This   5

[type of a proposition, namely, "Zayd is not non-seeing"] is

called a distorted negative proposition.[128] Seeing that this

has become known, it is necessary that it become known that

the subject [of a proposition] is either a general term or a

singular term.

The example of a singular term [used as a] subject is that

you say, "Zayd is a writer," or "Zayd is not a writer." This   10

[type of a proposition] is called a singular proposition or a

personal proposition. The first proposition [of the two given

above] is affirmative and the second is negative. But when the

subject is a general term, the proposition is not outside the

[following] two [classifications]:

Either

it is not declared upon how many the judgment [is, that is]

whether it is upon all [of the subject] or some [of the subject].

For example, you say, "Man is mobile," but you do not say

"every man" or "some man." This [type of proposition which is   15

affirmative but without any indication as to how many it applies

to] is called an affirmative indeterminate [or affirmative

unquantified proposition]. Again, you say, "Man is not mobile"
and this [type of proposition] is called a <u>negative indeterminate</u>
[or <u>negative unquantified proposition</u>].

Or   [30]

the quantity of the judgment is declared. And this [type of
proposition] is called a <u>determinate</u> [or <u>quantified proposition</u>].
And the word which manifests the quantity is called the <u>quanti-
fier</u>.

Quantified propositions are of four kinds:

One is that which makes the judgment on all [of the sub-
ject] by affirmation. For example, you say, "Whatever is a man   5
is an animal," or "Every man is an animal;" this [type of pro-
position] is called a <u>universal affirmative [proposition]</u> and
its quantifiers are the words "whatever," ["all that," "any-
thing that,"] and "every."

The second is that which makes the judgment on all [of the
subject] by denial or negation. For example, you say, "No man
is immortal." This [type of proposition] is called a <u>universal</u>   10
<u>negative [proposition]</u>. And its quantifier is the word "no."

The third is that which makes the judgment on a part [of
the subject] by affirmation or [the assertion of] existence.
For example, you say, "Some men are writers." This [type of
proposition] is called a <u>particular affirmative [proposition]</u>.
And its quantifier is the word "some."

The fourth is that which makes the judgment on a part [of
the subject] by negation and [the assertion of] non-existence.   15
For example, you say, "Some men are not writers." This [type

of proposition] is called a <u>particular negative [proposition]</u>,

and its quantifier is the word "some" [also]. It has other

quantifiers [too], these words are "not-all," "not-everything,"   [31]

and "not-every." [This is] for the reason that when you say,

"Not-all men are writers," or you say, "Not-everything that is

a man is a writer," or you say, "Not-every man is a writer,"

you have judged [as to something] not being [something else],

hence, these judgments are negative. You have also not judged

about all [of the subject], for the reason that when you say,   5

"not-all" [you do not exclude the possibility] that there may

be some [that are such and so]. Therefore, these utterances

of ours that we have made [using the quantifiers "not-all," etc.]

are particular negative.

The indeterminate [or unquantified] judgment is [really]

a particular judgment. [This is] for the reason that when you

say, "Man is such [and such]," [then in] your utterance [the

term] "man" may [mean] "all men," or it may [mean] "one man"

in that all men are men, and one man is also a man. Therefore,   10

["man" means] "some men" with certainty and "all men" [only]

with doubt.

Thus, if someone says, "Some men are such [and such],"

it is [then] not necessary from [here] that the other part is

opposite of that, for the reason that if all are [such and such]

then some are also [such and such]. Thus, a judgment about some   15

does not [necessarily] exclude the judgment about the rest

being likewise. But [we repeat that the judgment] is with

certainty about some and [only] with doubt about all. Thus,

it is clear that the indeterminate [or unquantified] judgment

is even as the particular judgment.

[Now] it is manifest that there are eight kinds of predica-   [32]

tive propositions: singular affirmative, singular negative;

indeterminate affirmative, indeterminate negative; and the

four quantified [propositions, namely,] universal affirmative

and universal negative, and particular affirmative and particu-

lar negative. Of these eight the singular [proposition] is   5

not useful in the sciences, and the indeterminate [proposition]

is judgmentally [the same as] the particular [proposition].

[Thus,] there remain, [as] propositions being useful in science,

[only] the four quantified [ones].

[It should be noted that] wherever [in a discourse] an

indeterminate [proposition] is used in place of a universal

[proposition], it throws [the discourse] into error and con-

fusion, as we will exhibit elsewhere.[129]   Hence, it is necessary

to abstain from [using] it.

It is [also] necessary that it be known that the judgment   10

of every proposition is:

Either

infallible and certain as, for example, you say, "Man is corpo-

real." [A proposition such as] this is called necessary.

Or

[the proposition] may be [true] or [may] be [untrue] as, for

example, you say, "Man is a writer." [A proposition such as]

this is called a possible [proposition].

Or

it cannot be [true] as, for example, you say, "Man is an angel."   15

[A proposition such as] this is called an <u>impossible [proposition]</u>.

The word "possible" happens to be [applied in] two senses:

One [sense] is [that] of "can be [or able to be]"[130] only.

In short, [it is the sense] of whatever is not impossible.

Necessary [propositions] fall under this [sense of] possible   [33]

for the reason that it is possible that a necessary [proposition]

be, but it is impossible that a necessary [proposition] not be.

The second [sense] is [that] of "It may or may not be."

This is [the sense of] "essential possible." A necessary

[proposition] does not fall under this [sense of] "possible."

In this sense [of possible, it is the case that of] whatever

it is possible that it be, it is [also equally] possible that   5

it not be. In the previous sense [of possible], however, it is

not the case that [of] whatever is possible that it be, it is

[also equally] possible that it not be.

And this much [as has been said in this chapter] is

sufficient in the exhibiting of the state of affairs [with

respect to] predicative propositions.

[WHEREIN ONE IS] TO FIND [A DESCRIPTION OF] THE STATE   [34]

OF CONJUNCTIVE CONDITIONAL PROPOSITIONS AND DISJUNCTIVE

CONDITIONAL PROPOSITIONS

[This description is] in the same manner that was used
[for] the predicative propositions.

Just as the predicative propositions have two parts,
[namely,] a subject and a predicate, the conditionals also have   5
two parts.

Conjunctive conditionals have only two parts, an antecedent
and a consequent. The antecedent is that in which the condition
is expressed.[131] And the consequent is that in which the result
of the condition is expressed.[132] An example of this is when
we say, "If the sun is risen, [then] it is day." Our saying,   10
"The sun is risen[133] is the antecedent, and our saying, "It is
day" is the consequent.

In the disjunctive [conditionals], however, one antecedent
may have one consequent or many consequents.

An example of the first [case] is when you say, "Either
this number is even, or it is odd." The first [part, namely,   15
"This number is even"] is the antecedent, and the second [part,
namely, "This number is odd"] is the consequent. Here, there
is no more than one [consequent to the antecedent].

An example of the second [case] is when you say, "This

number is either equal to, or less than, or greater than that   [35]

number." Here, one antecedent has two consequents. But it

may have more than two or [even] an unlimited[134] [number of

consequents]. For example, you say, "A number is either two,

or three, or four...[135] and so ad infinitum.

The difference between the antecedent and the consequent   5

[on the one hand], and the subject and the predicate [on the

other], is this, that a simple term[136] can stand in place of

the subject or the predicate but not in place of the antecedent

or the consequent, because the antecedent and the consequent

are each in themselves propositions.[137] For example, [when]

you say, "If the sun is risen, it is day," then your saying,

"The sun is risen" is a proposition, and your saying, "It is   10

day" is [also] a proposition. However, the word ["if" taken

together with the antecedent has the effect of] preventing

the antecedent from [being] a proposition.[138] The reason for

[this is] that when you say, "if the sun is risen" by the in-

clusion of the word "if" this clause ceased from [being a]

proposition in as much as it is neither true nor false.

[Similarly] the word ["then," which introduces the consequent,

taken together with the consequent, has the effect of] prevent-

ing the consequent from being a proposition.[139] The reason   15

for [this is] that when you say, "then it is day" [this clause,]

again, is neither true nor false. And [the case of] disjunctive

propositions is similar. That is, when you say, "either this

number is odd," then if the word "either" were not there, this   [36]

[purported] antecedent would be a proposition. [Again when you say,] "or it is even," then if the word "or" were not there, this [purported] consequent would be a proposition.

This, then, is one difference between the antedecent and the consequent [on the one hand] and the subject and the predicate [on the other].

The other difference is that wherever there is subject and   5
predicate, you [may] say that the [predicate is affirmed] or [else that] it is denied [of the subject].[140] For example, you [may] say, "Zayd is alive" or [you may say] "[Zayd] is not [alive]." But wherever there is an antecedent arid a consequent, you do not say that the consequent is affirmed of the antecedent or denied [of it].

Between [the relationship of] the antecedent and the consequent of conjunctive conditionals [on the one hand] and [the relationship of] the antecedent and the consequent of disjunctives [on the other], there are two differences: 10

One is that it is not possible[141] that the antecedent of a conjunctive conditional be the consequent and the consequent be the antecedent and [still] the meaning remains [the same]. For example, you say, "If the sun is risen, it is day." [Here] it is impossible that the [resulting] judgment[142] be the same as [the above, if] the antecedent became the consequent and the consequent the antecedent. In disjunctive [propositions], how-   15
ever, you [may] make any [of its component propositions] that you wish, the antecedent and the meaning [will] remain [the same]. For example, you [may], if you wish, say, "Either the number

is even or it is odd," or if you wish, you [may equally] say,

"Either the number is odd or it is even." The other difference   [37]

is that the consequent of the conjunctive [conditional] is com-

patible[143] with the antecedent and is a sequel[144] of it; as,

for example, [the relationship of its] being day with the

rising [of the] sun. But the consequent of the disjunctive

[conditional] is opposed to and incompatible[145] with the ante-

cedent [just] as being even is to being odd.   5

From [the discussion] prior [to] this it is true that a

conjunctive [conditional proposition's] being an affirmation

and affirmative is that you judge this compatibility [referred

to earlier] to exist. [So] for example, you say, "If the sun

is risen, it is day." And a conjunctive [conditional proposi-

tion's] being a denial and negative is that you judge this

compatibility as not existing. [So] for example, you say, "It   10

is not [the case] that if the sun is risen, it is night." And

it may be that the antecedent and the consequent be [both]

negative [while] the proposition in itself be affirmative,

since [in such a case] you have [in the proposition as a whole]

made an affirmation of [the presence] of this compatibility.

For example, you say, "If the sun has not risen, it is not day."

This [proposition] compared to the foregoing [namely, "It is

not the case that if the sun is risen, it is night] is affirma-

tive in that the existence and dependence of it not being day   15

has [already] been judged upon the sun not having risen.

The unquantified and quantified hypothetical [propositions]

are: whenever you say, "If or when the sun comes out it is day," [38]

and you do not add always, everytime, or sometime, [then] this

[would be an] unquantified conditional [proposition]. However,

if you say, "Everytime the sun comes out it is day," [then this

would be a] universal affirmative hypothetical [proposition];

when you say, "Sometimes [when] the sun is out it is cloudy,"   5

[then this would be a] particular affirmative [hypothetical

proposition]; and when you say, "It is never [the case] that

when the sun is out it is night," [then this would be a]

universal negative [hypothetical proposition]. And when you say,

"Not everytime the sun is out it is cloudy," [this would be a]

particular negative [hypothetical proposition].

It is possible that the hypothetical proposition be

universal while each of its two parts be particular: for

example, [suppose] you say, "Always [if] some men are writers,   10

[then] some animals are writers," [then] this is a universal

[hypothetical proposition] because you said always.

The affirmativeness [of] a disjunctive [proposition consists

in] that you assent to the noncompatibility [between its com-

ponents];   for example, you say, "Either it is thus, or it

is so [and not both]." Whereas [their] negativity [consists

in] that you negate this noncompatibility; for example, you say,

"It is not [the case that] a number is either even or white;   15

rather it is either even or odd."

And [their being] universal [consists in] this noncompatibility

[being] permanent. Thus you say, "Always it is either thus or

it is so." The particular [disjunctive proposition] is that [in   [39]

which] this noncompatibility is [present only] some of the time.

For example, you say, "It sometimes happens that a man is either in the boat or drowning." This happens sometimes only, that is, when he is in the ocean [and not in the boat]. The disjunction is actually the very same as this noncompatibility [namely, the alternatives mentioned in either or,] so that the   5 decision [as to what the case actually is] cannot be outside its disjuncts [namely, outside the alternatives mentioned in the disjunctive proposition]. Thus, you say, "This number is either equal to, or less than, or greater than that number."

[CHAPTER VIII]

MAKING KNOWN THE CONDITIONS [PERTAINING TO] CONTRA- [40]

DICTORY JUDGMENTS

The contradictory of a [given] proposition is a proposi-

tion which is opposed to [that proposition] either as an

affirmation or a negation. [Thus] if [the given proposition]

is affirmative, [the other] is negative, and if [the given] 5

is negative, this [i.e., the other] is affirmative. The manner

of their opposition necessitates in every case that one be

true and the other false; hence, one is contradictory of the

other.

The conditions required for this manner of opposition are

these: it is necessary that the meaning of the subject and

predicate, antecedent and consequent [occurring in the two

propositions] be the same, otherwise [the two propositions] 10

will not be contradictory of each other.[146] For example, a

person says, "The ram has a parent," and another says, "The ram

does not have a parent." [If] by one [use of the word] "ram"

they intend a sheep and by the other the Zodiac sign [Aries,

then] their assertions are not contradictory of each other.

This [is a case where] the difference [of meaning] is on the

part of the subject.

170

[Again if] it is said: ["Man is borne" and "Man is not   15

borne" using the word "borne" in one case to mean carried and

in the other case being in the womb,]^{147} then both [utterances]

are true and not contradictory of each other. This [is a case   [41]

where] the difference [of meaning] is on the part of the pre-

dicate.

[The violation of] these conditions is [clearly] revealed

here. [This matter] is, however, concealed in many places in

[the literature] of the sciences, and they are [thereby] thrown

into error.

Another condition is that it is necessary that the oppo-

sition not be [asserted] between part and whole [of the same

subject]; for example, [when] someone says "A person's eyes   5

are black" and [that "The person's] eyes are white, not black,"

intending by "black" the blackness of the pupil and intending

the denial of blackness to apply to the white portions [of the

eye].

The other condition is that the judgments be both either

potential or actual. Not, for example, that someone says, "This   10

fire burns," meaning potentially [as having the capacity to burn

something] and another says, "It does not burn," meaning that it

is actually not burning anything. Both of these utterances are

true and not contradictory one of the other.

And the other [condition] is that in both propositions the

[standard of] comparison^{148} be the same. Not, for example,   15

that someone says, "Ten is large," that is, [compared] to nine,

and another says, "Ten is not large," that is, [compared] to

eleven. Each of these two is true and they are not contradictory.

And other [conditions] are that the temporal [reference] be the same, not two [different] temporal [references]; and the [reference to] location be the same, not [to] two [different] locations. And to sum up, it is necessary that the two propositions[149] be [of] identical modality;[150] also it is necessary [that they have] the same predicate and the same subject.   [42]

Finally, if the subject is universal, then it is necessary that one proposition be universal and the other particular,   5
in that it is possible for both the universal [propositions] to be false. For example, you might say, "Every man is wise" and "No man is wise;" [now] it is possible that the particular [propositions resulting from each of these] are both true, so that you might say, "Some man is wise" and "Some man is not wise." Therefore, the contradictory of "every" is "not every" and the   10
contradictory of "none" is "some."

When [all] the conditions [stated above] are [properly] complied with, then, in every case one [of a pair of propositions] is true and one, [i.e., the other,] false.

Know also, that the above reasoning [applies, as well] to the case of conditional propositions.

CLARIFICATION OF THE CONDITIONS OF CONVERSION   [43]

The method of converting is: [in predicative propositions]

make the subject into predicate and the predicate into subject;

or [in disjunctive conditionals] make the antecedent [into] the

consequent, and the consequent [into] the antecedent, and keep   5

the affirmativity and negativity [of the disjuncts constant],

and the truth will be preserved.[151]

A universal negative [proposition] admits of conversion

and yields universal negative again. For, whenever it is true

that "No such is so," it is true that "No so is such;" or else

its contradictory "Some [part] of so is such" is true. Let this   10

part in every case be "that some." Thus, that some is that so

which is such, and it [i.e., that some] is precisely [that

which is] at once both such and so. Therefore, there is a such

which is so; but we had said [earlier] that it is true that no

such is so, and thus this [latter] is impossible. It is there-   15

fore evident that, since no such is so, no so is such.[152]

As to a universal affirmative [proposition], it does not   [44]

necessarily come about that in every case its converse be

universal affirmative [also]. [Thus] it is possible to say,

"Every man is animal," and not possible to say, "Every animal

is man." It necessarily comes about, however, that it converts

to particular affirmative, because whenever all <u>such</u> are <u>so</u>,　　　　5
[then] necessarily some <u>so</u> are <u>such</u>, or else no <u>so</u> is <u>such</u>.
But [if no <u>so</u> is <u>such</u>, then] it necessarily follows as was
shown, [namely] that no <u>such</u> is <u>so</u>, but [this is impossible
since] we have already said that every <u>such</u> is <u>so</u>.

[As to] a particular affirmative [proposition], the　　　　10
converse of it is [also] a particular affirmative. [Suppose],
for example, you say, "Some <u>such</u> are <u>so</u>," necessarily then some
<u>so</u> are <u>such</u> by [virtue of] the same sort of argument as we
have already stated.

However, [in case of a] particular negative [proposition]
it is not necessary that it have a converse, for it is possible
to say, "Not all animals are men," but not possible to say,　　　　15
"Not all men are animals."

[CHAPTER X]

IN THE DESCRIPTION OF SYLLOGISM   [45]

For every unknown there is a way that [one may become]

knowledgeable of it. Moreover, let us recall the two methods

for the [formulation of a] concept,[153] [namely] definition and

description.[154]

The method of verification is reasoning. Reasoning is   5

of three kinds: syllogism, induction, and analogy. Moreover,

to conduct an argument from [that which is] present to [that

which is] absent is also a part of analogical reasoning. Among

these three, the syllogism is [the most] reliable, and among

syllogisms, the demonstrative syllogism. However, until we know

what, in general, a syllogism is, it is not possible to know   10

what a demonstrative syllogism is.[155]

In general, a syllogism is a discourse in which something

is said, [such] that if that which is said in it is assented to,

then from it another discourse is necessitated in every case.

An example of this is that if someone says, "Every body[156]

is formed and every formed [thing] is originated," [then] this   15

discourse is a syllogism for the reason that every time that

both these propositions are assented to and accepted, [then]   [46]

from this another discourse is necessitated: [namely] that

"Every body is originated."

Similarly, if someone says, "If the world is formed, then the
world is originated. But the world is formed," then this too   5
is a syllogism. [This is so] because this discourse is com-
posed of two propositions, [such] that every time that both
[the propositions] are assented to, a third discourse, which
is a part of the two [propositions] and, what is more, a com-
ponent of one of them, comes about necessarily. This discourse
is: "The world is originated."

There are two types of syllogisms: One is called [syllogism]   10
of liason[157] and the other detachmental[158] [syllogism].

SYLLOGISMS OF LIASON   [47]

[In] syllogisms of liason two propositions are linked

[by each one's] containing a component [159] that is common to

both, but [they are] separate with respect to [their] other

components. Thus, from these [two propositions] another pro-   5

position follows necessarily, such that it has two components

which were not common to the [two original propositions]. An

example of this is [one] which we have [already given, namely,]

that every time it is accepted that "Every body is formed and

every formed thing is originated," [then] from this it ensues

necessarily that "Every body is originated." Thus, there are two   10

propositions here: one is that "Every body is formed," and the

other is that "Every formed thing is originated." One component

of the first proposition [160] is "body" and the other component

is "formed," while of the second premiss, one component is "formed"

and the other is "originated." Thus, "formed" is in both,   15

but one alone has "body," while only the other [has] "originated."

And of this proposition, which came of necessity, one component   [48]

is "body," and the other component is "originated."

The above discussion has revolved around three components,

[namely,] "body," "formed," and "originated;" [each of] these is

called a _term_. Now [the term] "formed" and anything [positionally] 5

resembling it is called the _middle term_. "Body," that is the

subject in the necessitated [proposition], is called the _minor_

term, and "originated" that is the predicate in the necessitated

[proposition], is called the _major term_.

[Each of] the two [original] propositions that are in the

syllogism is called a _premiss_, and the proposition that is neces- 10

sitated is called the _conclusion_. That [premiss] which has the

subject of the conclusion in it is called the _minor premiss_,

and that which has the predicate of the conclusion in it is

called the _major premiss_.[161]

The linking of these two propositions is called _liason_,

and the form of their linking is called _figure_.[162]

These figures are [of] three kinds: 15

The middle term is predicate in one premiss and the subject

in the other. This is called the _first figure_.

[The middle term] is the predicate in both [premisses]. [49]

This is called the _second figure_.

[The middle term] is the subject in both [premisses]. This

is called the _third figure_.[163]

The rule[164] [with respect to] the antecedent and consequent

of a hypothetical [proposition] is similar to the rule [regard-

ing] the subject and predicate of a categorical [proposition].

A syllogism issues [neither] from two negative [premisses], 5

[nor does one] issue from two particular [premisses]. [Further-

more,] every time that the minor [premiss] is negative while

the major [premiss] is particular, no syllogism issues.[165]

Thus, every figure has peculiar properties.

EXPOSITION OF THE CONDITIONS OF THE SYLLOGISMS OF THE FIRST

FIGURE

[Syllogisms in] the first figure have two merits. One   10

is that no [further] reasoning is necessary at all to certify

[the fact] that its syllogisms[166] are [indeed] syllogisms.

Such is, however, not the case with the other two figures. The

other [merit] is that each of the four quantified [propositions],

that is, universal affirmative, universal negative, particular

affirmative, and particular negative can occur as conclusions

in it.[167] In the second figure [however] the conclusion is   15

never an affirmative [proposition], [while] in the third figure

the conclusion is never a universal [proposition], as will be

shown.

There are two conditions [that must be satisfied] for   [50]

syllogisms to be syllogisms of liason of the first figure: one

is that it is necessary that the minor premiss be affirmative,

and the other is that it is necessary that the major premiss

be universal. If [these conditions were not met], then it

would be possible that the premisses be [both] true and the

conclusion false, and whatever [is a purported deductive argu-   5

ment], whose conclusion is not true when its premisses are at any

rate true, is not a syllogism.

Since the conditions [pertaining to this figure] are the

two conditions [mentioned above], there are therefore four syllogisms

[in] this figure.

First Syllogism

From two universal affirmative [premisses]:   10

An example of it is if someone says, "Every such is so, and every so is thus," from this conclusion ensues that "Every such is thus." For instance, you say, "Every corporeal substance is formed, and every formed [thing] is originated," from which the conclusion follows that "Every corporeal substance   15 is originated."[168] This conclusion is a universal affirmative [proposition].

Second Syllogism   [51]

From two universal [propositions], but the major [premiss] negative:

For example, someone says, "Every such is so, and no so is thus;" the conclusion follows that "No such is thus." For in-   5 stance, you say, "Every corporeal substance is formed, and no formed [thing] is eternal," it is necessitated from this that "No corporeal substance is eternal." This conclusion is a universal negative [proposition].

Third Syllogism

From [a] minor [premiss] particular affirmative and [a] major [premiss] universal affirmative:

For example, somebody says, "Some substances are alive,   10 and every live thing admits of a form of knowledge; therefore, some substances admit of a form of knowledge." This conclusion is a particular affirmative [proposition].

Fourth Syllogism

From [a] minor [premiss] particular affirmative and [a]

major [premiss] universal negative:

For example, someone says, "Some substances are souls, and   15

no soul is corporeal; therefore, some substances are not cor-   [52]

poreal." [The conclusion is a particular negative proposition.]

The [case] of hypothetical syllogisms is similar [with

respect to the foregoing]:

SYLLOGISMS OF THE SECOND FIGURE

The conditions of the validity of syllogisms of the second

figure are that one premiss be affirmative and one negative, and   5

[that of these] the major premiss in every case be universal.

Thus, [the number of] its syllogisms is four.

First [Syllogism]

From two universal [premisses with] the major [premiss]

negative:

As, for example, you say, "Every such is so and no thus

is so," from this the conclusion follows that "No such is thus."   10

The demonstration of [the correctness of this conclusion] is

that since my assertion that "No thus is so" is true;[169] there-

fore, its converse that "No so is thus" is [also] true, as has

[already] been said in the chapter on conversion. Thus, since

we have said that "Every such is so, and no so is thus," the   15

conclusion [arrived at] was correct,[170] that is that "No such   [53]

is thus."

Second [Syllogism]

From two universal [premisses with] the minor [premiss] negative:

For example, you say, "No such is so, and every thus is so." The conclusion follows that "No such is thus," for the reason that if you convert the minor [premiss] and, [positionally as to their occurrence,] exchange the premisses, [thus obtaining] that "Every thus is so, and, no so is such," then [from this] the conclusion follows that "No thus is such." This [latter] conclusion is convertible, [whereupon] it becomes the former conclusion, [namely,] "No such is thus."

Third [Syllogism]

From the minor [premiss] particular affirmative and the major [premiss] universal negative:

For example, you say, "Some such are so, and no thus is so," the conclusion follows that "Some such are not thus," for the reason that the major [premiss] admits of conversion and then [the syllogism in question] reduces to the fourth syllogism [in] the first figure, [whence] also this [same] conclusion follows.

Fourth [Syllogism]

From [a] minor [premiss] particular negative and [a] major [premiss] universal affirmative:

As, for example, you say, "Some such is not so, and every thus is so," the conclusion follows that "Not every such is thus,"[171] [that is, "Some such is not thus"].

It is not possible [to show] the correctness of the derivation of this conclusion by way of conversion, for the reason that the minor [premiss] is particular negative and [so] is not convertible, while the major [premiss] is universal affirmative and [so] its converse is a particular [affirmative proposition]. [Now] if you can conjoin the converse [of the major premiss] with the minor [premiss], there will be two particulars, and [we know that] a syllogism does not issue from two particular propositions.

[However,] there are two [other] methods [available] to   10
show the derivation of the conclusion [of the syllogism in question]. One [method] is called <u>ecthesis</u> and the other <u>reductio ad impossibile</u>. [Now] the [derivation] by way of <u>ecthesis</u> is this that since you said that "Some such is not so," [then] obviously that "some" is a thing [which is not so]; let that thing be <u>That</u>. Hence, we [may] say that "No <u>That</u> is   15
so, and every thus is so," [and] the conclusion follows that "No <u>That</u> is thus." Since this is valid, [so] we [may now]   [55]
say that "Some such is <u>That</u>, and no <u>That</u> is thus," [and] from this assertion it is correctly [inferable], therefore, that "Not every such is thus," [that is, "Some such is not thus"].

[The derivation] by the method of <u>reductio ad impossibile</u> is that you say if our assertion that "Some such is not thus"   5
is false, then necessarily "Every such is thus," and [since] we have [already] said that "Every thus is so," therefore, [from their conjunction] it is necessary that "Every such is so." But we had said [originally] that "Not every such is so,"

[however], this is impossible. Therefore, our conclusion ["Not every such is thus"] is correct.

SYLLOGISMS OF THE THIRD FIGURE   10

The condition for this figure is that the minor [premiss] in every case be affirmative and one premiss, [irrespective of] whichever [of the two] it is, be universal. Thus, the syllogisms of this figure are six.

First [Syllogism]

From two universal affirmative [premisses]:   15

For example, you say, "Every so is such, and every so is   [56] thus" [from which] the conclusion follows that "Some such is thus." The reason is that if you convert the minor [premiss, the whole thing] comes out thus: "Some such is so, and every so is thus," and [now] it reduces to the third syllogism of the   5 first figure, and the [above] conclusion follows.

Second [Syllogism]

From two universal [premisses], but the major [premiss] negative:

For example, you say, "Every so is such, and no so is thus,"   10 [from which] the conclusion follows that "Not every such is thus," for the reason that if you convert the minor [premiss, this syllogism reduces to] the fourth syllogism of the first figure.

Third [Syllogism]

From two affirmative [premisses], but the minor [premiss] particular:

For example, you say, "Some so is such, and every   15 so is thus," [from which] the conclusion follows that "Some   [57]

such is thus," for the reason that if you convert the minor

[premiss, this syllogism reduces] to the third [syllogism] of

the first figure.

Fourth [Syllogism]

From two affirmative [premisses], but the major [premiss]   5

particular:

For example, you say, "Every so is such, and some so is

thus," [from which] the conclusion follows that "Some such

is thus," for the reason that if you convert the major [premiss],

and so [now] we say, "Some thus is so, and every so is such,"

the conclusion follows that "Some thus is such," and then its   10

converse correctly ensues that "Some such is thus."

Fifth [Syllogism]

The minor [premiss] universal affirmative and the major

[premiss] particular negative:

For example, you say, "Every so is such, and not every so   15

is thus," [from which] the conclusion follows that "Not every   [58]

such is thus." It is not possible to derive [this conclusion]

by conversion by the same token as we said of that other one.[172]

It is, however, possible [to derive it] by ecthesis as well as

by reductio ad impossibile.

[Derivation by] ecthesis [proceeds] thus: Let that "so"

which is not "thus" be That, so that, no That is thus. Hence,   5

we [may now] say that "Every so is such, and some so is That,"

[from which] the conclusion follows that "Some such is That."

Afterward we [conjoin the conclusion just obtained with what we

had supposed, namely,] that "No That is thus," [from which,

therefore,] the conclusion follows that "Some such is not thus."

And [the derivation by] the <u>reductio ad impossibile</u>   10
method is this: If our statement that "Not every such is thus" is false, then, [necessarily,] "Every such is thus." So we may [now] say that "Every so is such, and every such is thus," [from which] the conclusion follows that "Every so is thus." But we had said [originally] that "Not every so is thus," but this is impossible, therefore the conclusion   15
that ensued [to begin with, namely, that "Not every such is thus"] is correct.

<u>Sixth [Syllogism]</u>   [59]

From [a] minor [premiss] particular affirmative, and [a] major [premiss] universal negative:

For example, you say, "Some so is such, and no so is thus," [from which] the conclusion follows that "Not every such is   5
thus," for the reason that if you convert the minor [premiss, the syllogism reduces] to the fourth [syllogism] of the first figure.

Besides [these], there are two other separate figures pertaining to hypotheticals such that you replace 'subject' and 'predicate' by 'antecedent' and 'consequent'.

[SYLLOGISMS FROM CONDITIONAL PROPOSITIONS]   [60]

DETACHMENTAL SYLLOGISMS OF HYPOTHETICALS

Detachmental syllogisms from hypotheticals issue from a

hypothetical [conditional proposition] and a [proposition] of

detachment. For example, you say, "If such and such a person

has a fever, then his pulse is fast"--this is the hypothetical   5

[conditional]; and you repeat, "But the person has a fever"--

this is [the proposition of] detachment. From these the con-

clusion follows that "The person's pulse is fast."

These syllogisms are of two types:

One is that the antecedent itself is the [proposition]

of detachment, and the conclusion it produces is the very   10

consequent itself, as [already] illustrated.[173] The other is

that the contradictory of the consequent is the [proposition]

of detachment. Thus, you say, with reference to this [same]

example, "But his pulse is not fast." The conclusion it

produces is the contradictory of the antecedent, that is,

therefore, that "The person does not have a fever."

However, if you make the contradictory of the antecedent

the [proposition] of detachment, that is, you say, "The person

does not have a fever," then a conclusion as to whether the   15

person's pulse is fast or not does not follow. Similarly, if

you make the consequent itself the [proposition of] detachment,

that is, you say, "But his pulse is fast," then a conclusion   [61]

as to whether he has or does not have a fever does not follow.

DETACHMENTAL SYLLOGISMS FROM DISJUNCTIVES   [62]

If the disjunctive [proposition] is composed of two parts,

and [if] you make a [proposition] of detachment out of any one

[but] exactly one [of the two parts], [then] it yields the

contradictory of the other as the conclusion. For example, you   5

say, "This number is either even or odd, but it is even,"

therefore, you say, "It is not odd." [If you say] "But it is

odd," you [would] then say, "It is not even." However, if you

make the contradictory of any one [of the parts into the pro-

position of] detachment, [then] it yields exactly the other

[part] as the conclusion. For example, you say, "But it is

not odd. Therefore, it is even." [On the other hand, you

might say], "But it is not even. Therefore, it is odd."   10

The [foregoing] rules are [applicable] within essential

disjunctive [propositions]. Within the non-essential dis-

junctive [propositions, however,] there may be rules that

are not of this sort.

If the disjunctive [proposition] has more than two [con-

stituent] parts, [and if] you make [the proposition of] detach-

ment exactly [the same as] any one [of the parts], then [it

will] detach the [negation of the] entire remainder [as the

conclusion]. For example, you say, "This number is either

greater than or less than or equal to [another], but this   15

number is greater than [the other number]," the conclusion

follows that, therefore, "[This number] is neither equal [to]

nor less than [the other number]."

[If] you make the contradictory of any one [of the parts

of the proposition of] detachment, [then] the remainder will

be the conclusion; and [proceeding] similarly till [only] one   [63]

[of the parts] remains. For example, you say, "but it is not

greater," the conclusion follows that "It is either equal [to]

or less [than the number]."

COMPOUND SYLLOGISMS   [64]

It is not the case that all conclusions are derivable from

just one syllogistic process, nor that two premisses are [always]

sufficient; on the contrary, it is the case that [some] points

can be validly made [only] by means of several [successive]

syllogisms. Thus, a conclusion is drawn from two premisses,

[and] that conclusion in turn becomes a premiss of another   5

syllogism, and [the process] continues in the same manner till

the last conclusion [arrived at] is the point [in question].

People do not [always] present every [compound] syllogism

arranged according to [the above] order. Indeed, there are

many who cast some premisses out either for the sake of brevity

or for [the sake of some other] strategem. Also, there are

many who transpose [the order of occurrence] of the premisses.   10

However, in reality, the [type] of syllogism [which] we

have described eventually results.

We present an illustration of this discussion [by an

example] from geometry.

The example is [of] what is known as the first figure from

the book of Euclid:

We have a [straight] line, say AB, and [using] this line   15

as a side, we want to construct for the sake of demonstration

a three-sided figure, which is called a triangle, and [which]

we claim is such that each side of it is equal one to the other.

We say that if we take the point A as the center of a   [65]

compass, open [the compass] to point B and trace a circle

around [point A]; and again if we take the point B as the

center and with the distance of A [from B] draw a circle

around B; then the [two circles] inevitably intersect each

other. We designate the point at the top of the lune as C,   5

and from that point we draw a straight line to A and [another]

straight line to B. We say, thus, that this figure which is

in the interior of the points BAC is a triangle [with] all three

sides equal.

THE DEMONSTRATION OF THIS

The two lines AB and AC are equal for the reason that   10

they come from the center to the circumference, similarly, the

two lines BA and BC are equal. And the two lines AC and BC

are equal for the reason that each [of them] is equal to [the

same line] AB. Therefore, on line AB [as base], we have con-

structed a triangle [such] that all three sides of it are equal

[to each other].

[The foregoing] is how syllogistic reasoning is used in

the literature. But [the situation] actually is as I wish to   15

state, [namely,] that there are four syllogisms here—all [of

them] from the first figure.

The first [syllogism] is this: "The two lines AB and AC
are two straight lines that extend from the center [of the
circle] to [its] circumference, and any two straight lines
that extend from the center [of a circle to its] circumference   [66]
are equal." The conclusion follows that "The two lines AB
and AC are equal."

The second [syllogism]: [This is] similar [to the first]
about the two lines BA and BC.

The third [syllogism]: "The two lines AC and BC are two
lines that are equal to one line AB, and any two lines that are   5
equal to one [and the same] line are equal to each other."
The conclusion follows that "The two lines AC and BC are equal."

The fourth [syllogism]: "The figure ABC which is on the
base AB is bounded by three equal lines, and any [figure] bounded
by three equal lines is a triangle all three sides of which are   10
equal." The conclusion follows that "The figure ABC which is
on the base AB is a triangle all three sides of which are equal."

Other [such] problems must [also] be worked out [according
to] the above syllogistic [procedure for compound syllogisms].

REDUCTIO AD IMPOSSIBILE SYLLOGISM

In the group of compound syllogisms is a [type] syllogism   15
known as reductio ad impossibile syllogism.

The difference between reductio ad impossibile [syllogism]   [67]
and the previous ones that are called straight or direct syllo-
gisms is that the reductio ad impossibile syllogism proves the
claim [in question] by showing its contradictory to be false.
It falsifies the contradictory [of the claim in question] in

this way, that it derives, by necessity, an impossibility from

it, and whatever is, by necessity, derived as impossible from   5

it is [truly] impossible. [This is] for the reason that if it

is not [truly] impossible, [then] it will never definitely be

the case that its impossibility cannot be avoided.

The reductio ad impossibile syllogism is composed of

two syllogisms:

One syllogism is from the group of liason syllogisms, which

I have described elsewhere, [the other] one is a detachmental   10

syllogism.

[For example, suppose] someone wants to prove that "Every

such is so." He says, "If 'not every such is so' and let us say

that we know without doubt [that] every thus is so, from which

it necessarily follows that not every such is thus; but this,

that the adversary be acknowledged, is impossible. As this is   15

impossible, hence, our claim that every such is so is true."

People in [attempting] to reduce this discourse to syllo-

gisms which are complete are faced with and are applying them-   [68]

selves to an arduous task.

Aristotle has referred to what I want to say. However, he

has said [only] this much that reductio ad impossibile [syllo-

gism] is composed of conditional [syllogisms]. And so this is   5

what I want to say [in order] to explicate [Aristotle's assertion],

that reductio ad impossibile [syllogism] is composed of conditional

[syllogisms]. The first syllogism is [a syllogism of] liason

[and is] composed of hypothetical and predicative propositions

in the following manner:

If my statement that "Every such is so" is false, then "Not every such is so" is true, and [let us say that] by unanimous agreement "Every thus is so," [from these] a conditional [proposition] follows as a conclusion, [namely,] "If 'every such is so' is false, then not-every such is thus;"[174] [in the   10 second syllogism] this conclusion [obtained above] is made a premiss again, and we say, "If 'every such is so' is false, then not every such is thus, but, by unanimous agreement, every such is thus."[175] This [proposition, namely, that every such is thus] is the [proposition of] detachment. The conclusion follows that "'Every such is so' is not false," therefore, it is true.

[On the other hand,] if one takes the contradictory of the   15 selfsame unanimously agreed to valid conclusion[176] of the [very] first syllogism and combines it with the premiss of whose truth there is [already] unanimous agreement,[177] [then] the correct conclusion itself follows without <u>reductio ad impossibile</u>. Thus, one says, "'Every such is thus, and every thus is so'   [69] therefore, 'every such is so'."

But there are many occasions in [a] discourse where <u>reductio ad impossibile</u> is very appropriate, and the discussion [is thereby] greatly shortened.

NOTES

NOTES

[1]The autobiography (dictated to Juzjani) and Juzjani's biography
of Avicenna is to be found in: al-Qifti, Tārīkh al-Hukamā', pp. 413-
426, and the Persian translation of this work (with the same title
but the translator unknown), pp. 554-570; al-Bayhaqī, Tatimmat Siwān
al-Hikmah, I, 38-59; II, 34-46; Usaybi'ah, 'Uyūn al-Anbā', II, 2-9; also
in the introduction to Avicenna's Mantiq al-Mashriqiyūn. Modern edi-
tions of the autobiography and Juzjani's biography are to be found in
Nafisi, Sarguzasht-e Ibn-e Sīnā, which has the Arabic from pp. 1-19 and
the Persian translation following the Arabic from pp. 1-24. Nafisi,
Pūr-e Sīnā, pp. 63-70; Gauhareen, Hujjat al-Haq Abū 'Alī Sīnā, pp. 356-
370.

The autobiographical part takes the reader up to the time when
Avicenna meets Juzjani; after this Juzjani begins his biographical
narrative.

All quotations from the autobiography-biography are either from
Nafisi, Sarguzasht, or from the Persian translation of al-Qifti, Tārīkh
al-Hukamā'; the English translations are by the present author.

[2]We have accepted the usual and oft adopted dates of Avicenna.
These dates are, however, not without dispute. See, for example,
Gauhareen, Hujjat, pp. 371ff; Rizwani, Abū 'Alī Sīnā, pp. 7-10, who
shares the view of Hairi Mazenderani in Hikmat-e bū 'Alī Sīnā, p. 1,
that Avicenna died in A.H. 427 or 428, which would make him either
fifty-seven or fifty-eight rather than definitely fifty-seven, if we

accept his date of birth established as A.H. 370, i.e., A.D. 980.

One of the reasons for accepting A.H. 370-428, i.e., A.D. 980-1037, is

the fact that this is the date which occurs in Juzjani (see Sarguzasht--

Persian, p. 18).

[3]Although Avicenna was not a preacher and Philo was, the spirit of

Wolfson's remarks about Philo and philosophy may well, mutatis mutandis,

be applied to Avicenna. See Wolfson, Religious Philosophy: A Group

of Essays, p. 1.

[4]For an informative and readable summary of life and politics in

tenth century Iran and Avicenna's place in it, see Afnan, Avicenna: His

Life and Works, pp. 39-82.

[5]Nafisi, Sarguzasht (Persian), p. 1.

[6]Nasr, Three Muslim Sages, p. 20.

[7]Nafisi, Sarguzasht (Persian), p. 1.

[8]Rizwani, Abū 'Ali Sinā, p. 12, identifies this man as Mahmood

Massāh.

[9]In Nafisi, Sarguzasht (Arabic), p. 1, 'Zahed' seems to be included

as part of the name.

[10]Abū 'Abdallah Ibrahīm bin Hosain Tabri Natili. See Rizwani,

Abū'Ali Sinā, p. 13, n. 1 and n. 2, and Gauhareen, Hujjat, p. 357, n. 4.

Dahkhoda calls him "one of the mathematicians," see Dahkhoda, Lughat

Nāmeh, II, 615-616, and Brown says that Natili was a physician, see

Browne, A Literary History of Persia, II, 106.

[11]al-Qifti, Tārīkh (Persian), p. 556.

[12]Ibid.

[13]Ibid.

[14]Ibid.

[15]Ibid.

[16]Ibid., pp. 559-560.

[17]A possible exception is Abū Sahl al-Masīhī with whom Avicenna might have studied medicine, see Nasr, Three Muslim Sages, p. 20. The autobiography is silent on this point; however, see Rizwani, Abū 'Alī Sinā, p. 16.

[18]al-Qifti, Tārīkh (Persian), p. 557.

[19]Ibid.

[20]Ibid., p. 558.

[21]Ibid.

[22]Ibid.

[23]Ibid., pp. 558-559.

[24]Ibid., p. 558.

[25]According to Weisweiler (see Weisweiler, Avicenna...Seiner Zeit, p. 62) there were libraries in Gurganj, Rai, Hamadān, and Isfahān. In fact, according to Padover, "every important city in Persia had its library." (See Padover, "Muslim Libraries" in The Medieval Library, p. 353.) There is much need for research in the history of Persian libraries, especially as to their contents.

[26]See Rescher, Development of Arabic Logic, p. 49, Table V.

[27]See Nafisi, Pūr-e Sīnā, pp. 184-185, who quotes from Muhammad Baqar Khwansari, Rūzat al-Jannāt, (3rd printing; Tehran: n.d.), pp. 240-241.

[28]This is the number in Nafisi, Sarguzasht (Persian), pp. 18-24. There is, however, disagreement as to the number of his works, see, for example, al-Qifti, Tārīkh (Persian), pp. 560-561.

[29]Nafisi, Sarguzasht (Persian), p. 13.

[30]Ibn Sina, Dānish Nāmeh-e 'Alai (English), [1].

[31]Nafisi, Sarguzasht (Persian), p. 10ff.

[32]It was certainly after more than four months into the reign of Sama' al-Dawla. Even after 'Ala al-Dawla Kakūyah's first campaign against Hamadan in A.D. 1021, Avicenna was still in Hamadān and did some writing. He finally left Hamadan incognito, arriving in Isfahan after many hardships (see Nafisi, Sarguzasht (Persian), pp. 10-11). All this may easily bring us to A.D. 1022 or 1023 as the year of Avicenna's arrival in Isfahān.

[33]A.D. 1021-1037 seems to be a date with wide acceptance. See Ibn Sina, Elahiyat Dānish Nāmeh-e 'Alai, ed. by Muhammad Moin, p. ⊃ , and Peters, Aristotle and the Arabs, p. 107.

[34]Ibn Sina, Dānish Nāmeh (English), [1].

[35]Safa, Tārīkh-e Adabiyat dar Iran, p. 158.

[36]Nadim, Kitāb al-Fihrist, I, 24.

[37]Safa, Tārīkh, p. 161.

[38]Browne, A Literary History, II, 115.

[39]The situation with respect to the use of Arabic was the same with learned Muslims and Jews in Spain, for example, Maimonides' Guide to the Perplexed and Treatise on Logic are in Hebrew script, but the language is Arabic.

[40]Ibn Sina, Dānish Nāmeh (English), [1], LL. 10ff. The mention of the king's orders may also have served as an apologia.

[41]For example, the Persian pareh for the Arabic juz, see Persian text p.[47], LL. 4ff. He is not consistent in this practice, though; and, of course, he could not have replaced every Arabic word by a Persian word. There is, however, a general decline in the use of Arabic

words compared to what one might normally expect. This last state

of affairs, though not the specific example, is noticed by Rypka in

Iranische Litteraturgeschichte, p. 151.

[42]For example, the Persian garweedan for the Arabic tasdīq.
See Persian text, p. [4], LL. 6-7.

[43]Afnan, Avicenna, p. 81.

[44]Ibid.

[45]Brockelmann, Geschichte der arabischen Litteratur (2nd edition),
I, 590, only mentions the book but does not list any commentaries.
More importantly, for the Turkish case, the book is also listed without
commentators by Haji Khalifa in Kashf al-Zunūn, III, 185. Rypka,
Iranische, also does not list any commentaries.

[46]Miller, The Palace School of Muhammad the Conqueror, p. 110.

[47]A note, penned in A.H. 1127 by the former owner Muhammad
Naseeruddin, to the British Museum, Ms. Or. 16,830, fol. 1b (which is
part of our Ms. B.), says in part "... God be praised that after years
of search his [Naseeruddin's] wishes to be [the owner of] this great
Grace have at length been fulfilled." It is noteworthy that the book
was rare in India where one would suspect Persian as having wider use
than Arabic even in philosophical circles.

[48]We have found no Latin translations of Dānish Nāmeh. It does not
appear in Domingo Gundisalvi, Avicennae Opera, first printed in Venice,
A.D. 1495, and it is not one of the works considered by Prantl in
Geschichte der Logik, II, 325-367.

[49]The date of publication and the name Syed Asad Ullah, the
person who arranged for its publication, will be found on the added
title page.

[50]Under the editorship of Ahmad Khurasani.

[51]They name and describe only ten but also use others described in Moin, Elahiyat Danish Nameh.

[52]All references are in this case to Moin and Mishkat, Risala Mantiq Dānish Nāmeh-e 'Alaī.

[53]Where 'p' and 'q' have the same substituends; or the expression may be derived from 'if p then q' by the rule of uniform substitution.

[54]Moin and Mishkat, Risala Mantiq, p. 34, n. 5.

[55]Ethé, Catalogue of Persian Manuscripts in the India Office Library, I, 1209.

[56]The continuation of folio 3^a is on 4^b rather than on 4^a where it should be. The material on folio 5^a instead of continuing on folio 5^b is continued on 3^b, and the new section starting 3^b and continuing through 4^a continues on 5^b instead of 4^b.

[57]Perhaps the manuscript was bound once, then pages started falling off, and it was rebound with the present result.

[58]For example, juz'ī for juzwī.

[59]Rieu, Catalogue of Persian Manuscripts in the British Museum, II, 433-434.

[60]See note 47 above.

[61]Rieu, Catalogue, II, 433.

[62]See B folio 29^b ff.

[63]See p. vii.

[64]We have indicated special problems with respect to these variants on pp. 8-9.

[65]Ibn Sina, Dānish Nāmeh (English), [1] and [2].

[66]See British Museum, Persian Ms., Add. 16,659, folio 306^b.

[67]Avicenna's classification of sciences follows that of Aristotle.

[68] Ibn Sina, Dānish (English), [2], LL. 5-15.

[69] That is, metaphysics, mathematics and physics.

[70] vi 1026a20-25. For further evidence see 1026a25-32.

[71] Zeller, Aristotle and the Earlier Peripatetics, I, 163.

[72] Ibn Sina, Dānish (English), [6], L. 13ff.

[73] Ibid., [6], L. 17.

[74] Ibid., [7], LL. 3-5.

[75] Essentially this is also Hamilton's view. Hamilton, Lectures on Logic, p. 7.

[76] Ibn Sina, Dānish (English), [5], L. 16 - [7], L. 5ff., and [45], LL. 4-5.

[77] A passage from the Shifa' showing this is quoted in Madkour, L'Organon d'Aristote dans le monde arabe, p. 50.

[78] The list of the predicables is that of Porphyry.

[79] For this interpretation see Ibn Sina, Dānish (English), [10], L. 12ff.

[80] Ibn Sina, Dānish (English), Chapter III.

[81] Ibid.

[82] Avicenna tries to tell us how to recognize an essential predicate in Dānish (English), [10], L. 15ff., but this still leaves the question open.

[83] Ibn Sina, Dānish (English), [25], L. 5ff. See also Aristotle, De Interpretatione, iv 17a4-6.

[84] Aristotle, De Interp., iv 17a6ff.

[85] Ibn Sina, Dānish (English), [26], LL. 2-7.

[86] Ibid., [25], L. 5.

[87] Aristotle, Analytica Priora, i7,29a27.

[88]Ibn Sina, _Dānish_ (English), [31], L. 17.

[89]Aristotle, _An.Pr._, i7,29a27.

[90]Ibn Sina, _Dānish_ (English), [31], LL. 7-11 and also LL. 8-17.

[91]_Ibid._, [30], LL. 5-6.

[92]Aristotle, _An.Pr._, i2,25a14.

[93]Ibn Sina, _Dānish_ (English), [28], LL. 3-7.

[94]_Ibid._, [26], LL. 11-16 and other places.

[95]_Ibid._, [34], LL. 4-5. Also see [35], L. 5ff.

[96]_Ibid._, [34], L. 6.

[97]_Ibid._, [35], LL. 1-3.

[98]_Ibid._, [35], LL. 9-16ff.

[99]_Ibid._, [37], L. 4ff.

[100]_Ibid._, [35], L. 2.

[101]Rescher in "Avicenna on the Logic of Conditional Propositions," _Studies in the History of Arabic Logic_, p. 72, points out that the "exclusive character of disjunction is quite clear throughout Avicenna's discussion."

[102]Ibn Sina, _Dānish_ (English), [39], L. 4.

[103]_Ibid._, [46], L. 11 and [62], L. 1ff.

[104]_Ibid._, [60], L. 6 and L. 9. It is clear that he means the antecedent.

[105]Gyeke, "Ibn al-Tayyib's Commentary on Porphyry's Eisagoge," appendix.

[106]For example, Aristotle, _An.Pr._, i4,25b37, a translation of the passage bringing this out is done by Kneale, _Development of Logic_, p. 73, where also the presentation of syllogistic figures in conditional form is discussed.

[107]Steinschneider in <u>Die Arabischen Übersetzungen aus dem Griech-</u>
<u>ischen</u> does not record any. There is also no evidence of Boethius,
<u>De Syllogismo Hypothetico</u>, being available to Avicenna.

[108]See note 163 and note 165.

[109]<u>Gardish</u> also means "revolved."

[110]That is, metaphysics.

[111]Wolfson in his ground-breaking study, "Taṣawwur and Taṣdīq," says
that "Throughout the history of Arabic philosophy, beginning with Alfar-
abi, works on Logic open with the formula that knowledge is divided
into <u>tasawwur</u> and <u>tasdīq</u>," p. 114. A detailed analysis of <u>tasawwur</u>
and <u>tasdiq</u> in Avicenna's logic has yet to be made.

See also, Wolfson, "The Internal Senses in Latin, Arabic, and Hebrew
Philosophic Texts," pp. 69-133.

Also see note 155 below.

[112]<u>Muhdath</u> is from <u>ihdath</u> which means production, creation, inven-
tion, etc. (For further discussion on this term, also see Goichon,
<u>Lexique</u>, p. 64.) I have used "originated" because Avicenna believed in
the theory of emanation; any other translation, e.g., created, etc.,
would make no difference as far as the example is concerned, for the
point being illustrated here is purely logical.

[113]See note 155 below.

[114]P. [9], L. 3. <u>Lafz</u> may be translated by "word" or "expression"
or "term." Although, perhaps, the most neutral translation would have
been "expression." We have preferred "term" because clearly he intends
to classify meaningful expressions, not particles or conjunctions or,
for that matter, quantifying expressions. This is, then, a restrictive
and technical use of the expression <u>lafz</u> as against the non-technical

use of <u>lafz</u> in <u>lafz-i shart</u> (particle or word of conditionality) on
p. [35],L. 11, and <u>lafzi mofrad</u> (single word or letter) on p. [28], L. 3.

It should be noted that our technical interpretation of <u>lafz</u> is un-
fortunately strained by Avicenna's first example of a compound term,
i.e., "The man is learned." But this does not seem to affect his later
discussion.

[115] This is done in the <u>Dānish Nāmeh</u> section on geometry.

[116] That is, "What is it?"

[117] That is, "What kind of thing?"

[118] That is, <u>infima species</u>.

[119] Aristotle, <u>Topica</u>, v 2, 129b10-13.

[120] <u>Ibid</u>., vi 4, 142a34-142b6.

[121] <u>ma'nī</u> (<u>ma'nā</u> in Arabic): معنى

[122] <u>dalīl</u>: دليل

[123] <u>kai</u> : كى .

[124] <u>dalīl</u>. An alternative translation here could be "tokens."

[125] <u>ma'nī</u>: معنى

[126] His examples indicate that he should have used <u>harf</u> here.

[127] <u>mūjiba ma'dūla</u>. These are distorted in the sense that they are
not in standard form. It should be noted, however, that Goichon,
<u>Lexique</u>, p. 314, translates <u>qadīya ma'dūla</u> by <u>proposition equivalente</u>,
but that translation does not seem to make sense here.

[128] <u>saliba ma'dūla</u>. See note 127 above.

[129] Manuscript A, folio 43^b, LL. 4-10; Moin and Mishkat, <u>Dānish Nāmeh</u>,
p. 161, L. 4ff.

[130] The word, <u>shayad</u>, used here is also used on p. [32], L. 12, but
we have translated it as "can be [or able to be]" in order to emphasize

the sense of the next sentence in the text. This subsection (p. [32],
L. 10 - p. [33], L. 7) is in need of further investigation, for
example, in the light of Aristotle's remarks in <u>De Interp.</u>, xiii 22b7-20.

[131]Literally: "...with which the condition is associated [or
linked, conjoined, bound together, etc.]."

[132]Literally: "And the consequent is that which is the response
[or reply, answer]." Evidently, Avicenna intends t o say that the <u>tālī</u>
is the <u>jawāb al-shart</u>, i.e., the <u>apodosis</u>.

[133]All manuscripts and the printed text have, "If the sun is risen,"
but Avicenna's subsequent discussion precludes the inclusion of "if;"
it therefore seems to be a consistent scribal error and hence has been
edited out here.

[134]Literally: "without count."

[135]This reflects the standard that an indefinitely characterized
number is either 1, 2, ...

[136]See note 114 above.

[137]What he means is that in 'S is P' one may replace 'S' and 'P'
by simple terms, but that in 'if p then q' one cannot replace 'p' and
'q' by simple terms.

[138]A more literal translation would be, "However, the word of con-
dition withdraws the antecedent from [being] a proposition."

[139]A more literal translation would be, "And the word of answer
withdraws the consequent from [being] a proposition."

[140]The literal translation would be "And the other difference is
that where there is a subject and predicate you say that the subject
is predicate or is not."

[141]<u>Nashāyad</u> also means "improper."

^{142}The text has <u>qadīya</u>, but the sense is preserved better with "judgment."

^{143}<u>muafiq</u>. This term is not used again; it is replaced by its synonym, <u>sāzgārī</u>.

^{144}دم (<u>dum</u>). We read this term as <u>dum</u>, not <u>dam</u>, hence the pointing is important. Literally <u>dum</u> means "tail," and "end," etc.; hence, derivatively, in this passage we have taken it to mean "sequel."

^{145}Logical incompatibility is meant here.

^{146}The requirements that the subjects and predicates be the same, and that "the terms [be] used without ambiguity" are given by Aristotle in <u>De Interp.</u>W17a30ff. We have not been able to locate the Avicennian requirement on the antecedents and the consequents in Aristotle.

^{147}In order to make the point, the example in Persian, given by Avicenna, depends on the ambiguity of the predicate term, as does the English substitute given here. In Avicenna's example the predicate term <u>shirīn</u>, which means both "milky" and "sweet," makes the point in Persian, but its English translation does not.

^{148}<u>Izāfat</u> (اضافت), a grammatical term, seems to have been borrowed for the logical (philosophical) notion of relation. In this passage it probably means the <u>relatum</u>.

^{149}<u>hukm</u>.

^{150}P. [42], L. 3. There seem to be some problems with the interpretation of the requirement of the contradictories that they be <u>yak-jihat</u>, یکجهت i.e., identical <u>mode</u>; "identical" because Avicenna uses <u>yak</u> instead of <u>hamān</u> همان (same); "mode" is where the problem is. "Mode" in what sense—should they have identical modality? (This is what I think he means.)

Assuming he could not use "mode" ambiguously, since, if "mode"
is taken to indicate, for example, potential and actual requirement
(p. [41], LL. 9-10), the use of jihat, on p. [42], LL. 2-3, would not
constitute a new requirement. Also the requirement of identical
modality would then be missing from requirements of two propositions'
being contradictory one of the other. Hence, my interpretation of
jihat, here indicating modality, means that propositions of non-
identical modalities (modes) cannot be opposed as contradictories.
It could be that the use of "mode" here means to differentiate those
propositions of which truth or falsity can be predicated as against
those (e.g., modal propositions) of which, perhaps, it cannot be
predicated. This latter will depend, of course, on whether or not
Avicenna thinks we can predicate truth or falsity of modal proposi-
tions, which will perhaps provide the answer for the interpretation
of jihat as used here. The problem of modal propositions is not a
part of this study. However, future and extensive research of modal
propositions in Avicenna needs to be undertaken.

[151]P. [43], LL. 4-5. The interpretation is clear; he is author-
izing '$(p \supset q) \supset (\sim q \supset \sim p)$'. What he means when he says, "and keep the
affirmativity..." is clearly that after conversion of conditional
propositions, the constituent propositions in the resultant complex
proposition should be denials of the original constituant proposi-
tions, and then he adds that the truth will be preserved.

[152]P. [43], LL. 7-16. This is a cumbersome way of stating the
argument, although it is not cumbersome in Persian, since the words
fulān and bāstār have the philological characteristics of substantives
as well as variables, almost names in sound and in writing, but they

are not substantives. In English they are translated as 'such' and 'so', and when they are so used, the argument becomes unnecessarily cumbersome. Obviously, Avicenna used these terms to keep the argument perfectly general, since any substantive (or name or even a proposition) may be substituted uniformly for fulān and bāstār. He could, of course, have used letters from the alphabet (a practice not unknown to him, p. [28], L. 4-7). Indeed, manuscript ں uses the name of the first letter of the alphabet (see Moin and Mishkat, Dānish, p. 57, nn. 8-9), which gives greater perspecuity. Unfortunately, though, manuscript ں also uses particular examples which tarnish the generality of the argument somewhat, and just a part of it cannot be adopted without making the adoption artificial and strained.

¹⁵³See p. [4], L. 3.

¹⁵⁴See p. [20], L. 2 - p. [21], L. 6.

¹⁵⁵We have consistently interpreted (p. [45], LL. 4-10) tasdīq and garweedan: نصدیق ; گرویدن , as "verification" with the possible exception of p. [4], L. 2, where garweedan is most likely not used in its technical sense. Since henceforth Avicenna expounds on reasoning, largely leaving aside epistemological considerations, this is perhaps a suitable occasion to consider the epistemological status of tasdīq and garweedan as one of the two ways of knowing and see how this way of knowing comes about. Although these questions have a bearing on the translation of tasdīq and garweedan, they go far beyond the translation itself.

No specific method of verification is stated on p. [4], L. 7. The present passage characterizes this method as argument or reasoning.

Avicenna states that, of the three types of reasoning, syllogistic
reasoning (qiyās ‎قياس‎) is the most reliable. Since induc-
tion and analogy are not our concern in the present study, we will
concentrate on syllogistic reasoning (qiyās).

Lest the term qiyās be construed to mean only the categorical
syllogism, we hasten to add that here the term qiyās is to be taken
in its broader sense of deductive argument. A broad construal of
the term qiyās will in effect include conditional arguments as
acceptable procedures for verification, since there is neither
internal nor external evidence that they ought to be excluded as
methods of verification. Thus, it is clear that as methods of
verification, Avicenna intends both conditional syllogisms and
categorical syllogism.

With respect to categorical syllogism we know that:

a) the first figure is superior to all others (p. [49], L. 10);

b) compound syllogisms are analyzable into several distinct
arguments, some of which are categorical syllogisms in various figures
(see p. [64]ff) and presumably some conditional arguments;

c) all the various figures are reduceable to the first figure.

On p. [45], LL. 7-9, Avicenna remarks that for the purpose at hand
"the syllogism is the [most] reliable, and among syllogisms the de-
monstrative syllogism." Although "demonstrative syllogism" as such
falls outside the concerns of this study, we might nevertheless
remark that since we have already argued for a broad interpretation
of the term qiyās, the term "demonstrative syllogism" will on this
interpretation not be confined to the formal structure of categorical
syllogisms but will include conditional arguments as well; while the

requirements on the epistemic status of the premiss of a "demonstrative syllogism" will apply equally to both kinds of arguments.

We are now ready to turn to the specific issue of deductive reasoning as a method for verification. We begin this discussion by quoting two passages that illustrate verification.

1) "... to comprehend what the soul is and form a conception of it and to judge the immortality of the soul and to verify it" (p. [4], LL. 9-11).

2) "... an example of this in the area of reasoning and verification is that if it is not known to us that the world is originated and somebody [by way of] disclosing [this] to us says, 'The world is formed and whatever is formed is originated'..., we come to know that which we did not know..." (p. [5], L. 16 - p. [6], L. 5).

The second passage has already formulated a proposition, namely, "The world is originated," and we do not know whether it is the case or not. The first passage does not have an already formulated proposition, but we easily could formulate one, viz., "The soul is immortal." In either case we have a proposition which "we do not know" and which we need to verify so that we may know.

The second passage accomplishes this task explicitly; for here we are presented with the conjunction of two propositions which serve as premisses for a syllogistic argument whose conclusion is the proposition in question, thus:

> The world is formed.
>
> <u>Whatever is formed is originated.</u>
>
> ∴ The world is originated.

Keeping in mind that "verification" is here used in the sense of
"to make it true," we may, in view of the discussion thus far, state
the Avicennian idea of verification thus: a proposition is verified
if it is either deductively derived from or deductively derivable from
premisses whose truth is accepted; this is the weakest interpretation
of <u>garweedan</u> and <u>ma danistam</u>, that is to say, if the proposition in
question is the conclusion of a deductive argument (<u>qiyās</u>).

In other words, in order to verify a proposition we must construct
a deductive argument whose conclusion is the proposition in question:
if we are successful in doing so the proposition is verified.

Three considerations or questions arise with respect to this
procedure:

1) From where do we obtain premisses to construct the desired
argument?

2) What about the validity of the argument thus constructed?

3) Isn't the truth of the premisses more critical than merely
being "accepted as true?"

These questions are interrelated, but we will take them separately
to facilitate our exposition.

We shall also see that these questions will lead us to modify our
statement of the Avicennian idea of verification.

Avicenna answers the first question by giving us a list of possible
sources of premisses. These are:

a) a priori knowledge (<u>awwal</u> <u>khirad</u> - اول خرد), p. [4], LL. 14-15.

b) senses (<u>hiss</u> - حس), p. [4], L. 17.

c) reliance on authority (<u>az</u> <u>buzurgān</u> <u>va</u> <u>dānāyān</u> -از بزرگان و دانایان),
    p. [5], LL. 1-2.

d) consensus of opinion (<u>ittifāq mardum</u> - اتفاق مردم), p. [5],

    LL. 3-4.

e) those other propositions that have been assimilated in the corpus

    of our knowledge by previous processes of verification (see p. [6],

    LL. 1-8 and p. [4], LL. 9-12).

The second question is in effect answered by the Avicennian view

of the syllogism, according to which no argument is termed a "syllogism"

unless it is valid. See p. [50], LL. 5-6. (Whether or not Avicenna

specifically recognizes "validity" is problematic. It is nevertheless

the case that most likely for him, any argument which is not valid--as

we understand the term-- would not be called a syllogism. See note 165.)

The third question needs further discussion since all that a

valid deductive argument (including the Avicennian view of syllogism)

guarantees is that if the premisses are true, the conclusion must be

true. We might say that if the premisses of a deductive argument are

accepted as true and the argument is valid, then there is no escape

from accepting the conclusion as true. But the validity of a deduc-

tive argument is no guarantee of the truth of the individual propo-

sitions that go to make up the deductive argument. That is, not only

can we have a valid deductive argument with true premisses but also

false premisses or at least one false premiss. In the latter case,

that is in the case of a deductively valid argument all or one of

whose premisses are false, it does not matter whether the conclusion

is true or false; the argument remains valid in either case as the

truth-value of the corresponding conditional, having the premisses

as the antecedent and the conclusion as the consequent, is true in

either case.

But the burden of the Avicennian idea of verification (tasdīq and garweedan), as we have indicated, is that we be able to testify with certainty as to the truth of the proposition which has been verified. Obviously this view of verification cannot countenance a situation where one or all of the premisses of the argument which is supposed to verify a given proposition are false. We therefore must have a deductive argument the truth of all of those premisses is not just merely accepted but guaranteed.

There seem only two sources of such premisses:

a) they are themselves verified propositions, and we know them (i.e., they are knowledge). As he says in connection with 2), on page 210, that before we know that the world is accidental "... it is necessary that we should have [accepted it as] verified and hence known..." (p. [6], LL. 1-5). These verified propositions themselves rest on other verified propositions and so on till eventually we are led to

b) the first principles or primary premisses. Eventually, then, verification rests on syllogisms whose premisses are true and primary, and, being primary or first principles, their prior intelligibility is guaranteed. In short, then, the syllogism by means of which a proposition is verified has for its premisses either propositions that are true and primary or the conclusions of demonstrative syllogisms; which is what he hints at when he says that among the three kinds of reasoning, "the syllogism is [the most] reliable, and among syllogisms the demonstrative syllogism" (p. [45], LL. 8-9).

We may now restate the Avicennian idea of verification thus:

A proposition R is verified if and only if there

exists proposition P and proposition Q such that

P is true and Q is true and such that R is de-

rivable from the conjunction of P and Q.

Whatever is thus verified is no longer a matter of opinion but

gains entry into the corpus of knowledge. We may parenthetically

remark that knowledge thus consists only of truths.

Induction and analogy are of course not to be neglected, in that

they often lead to useful and valuable propositions; but these are

only opinions-- they are not verified and one cannot testify to their

truth. Epistemic certainty obtains only with verification.

[156]That is, corporeal substance.

[157]Iqtirānī : اقترانی

[158]Istethnā'ī : استثنائی

[159]P. [47], L. 4. Avicenna has consistently used juz or pareh from

p. [47], L.13 to p. [48], L. 4 to speak of the words that form the

subject and predicate of a proposition. He could have used "subject"

and "predicate," but he wanted a more general term that could be used

indiscriminately to refer to either the subject or the predicate of a

proposition and at the same time indicate that the word thus referred

to is a part of a proposition (excluding the copula - although it is

not necessary to exclude it since ast is also a juz or a pareh of a

given proposition). Only on p. [48], L. 4 does he give an ostensive

definition of "term." The fact that that, which in literature is known

as "term," is defined so late in the work, and then only in connection

with syllogisms (whereas he could have done so much earlier in the

discussion of propositions) would seem to indicate that he intends

to reserve the word had for terms of a proposition in context of a

syllogism. Otherwise, the various parts of a proposition would be

indiscriminately   referred to as _juz_, which I have translated as "component," rather than as "term," in order to preserve the technicality of _had_ and the everyday generality of _juz_ (or in Persian _pareh_ in several manuscripts). We may, of course, speak of "terms of a proposition" whether the proposition is in a syllogism or not, but we must remember that for Avicenna _had_ is a technical term and _juz_ is not (although _juzwī_ is a technical term in the classification of propositions). Thus in 'S is P', 'S' is a _juz_; 'is' is a _juz_; and 'P' is a _juz_ of the proposition; but only 'S' is a _had_ and 'P' is a _had_ of the proposition. (Thus to translate _juz_ as 'term' would be to offend the development of the subject, that is, development as Avicenna seems to want.)

[160] This is a non-syllogistic use of the term _muqaddima_.

[161] P. [48], L. 4-14. On this page Avicenna has defined various technical syllogistic terms; all these terms are defined with reference to AAA, first figure, i.e., "Barbara." The following example will show the location of various terms as well as illustrate the Avicennian paradigm for the order of premisses in "Barbara:"

      (1) All S is M

      (2) All M is P

      (3) All S is P

where propositions numbered (1) and (2) are the premisses, and the proposition numbered (3) is the conclusion.

Middle term: the term M which is common to both (1) and (2).

Minor term: the term S, the subject of the conclusion.

Major term: the term P, the predicate of the conclusion.

Minor Premiss: The premiss which contains the subject (here S) of the

conclusion. The minor premiss in this example is

premiss (1).

Major Premiss: The premiss which contains the predicate (here P) of

the conclusion. In this example the major premiss is

premiss (2).

[162] P. [48], LL. 13-14.

" و گرد آمدن این دو مقدمه را اقتران خوانند و مرتب کرده آمده را بشکل خوانند "

There are several difficulties in this passage:

1) Why is it so important to define <u>iqtiran</u> which from this passage

seems to be synonymous with <u>gird amadan</u>; but it is not clear from the

passage whether the process of combining or bringing together is called

<u>iqtiran</u> or the product is called <u>iqtiran</u>.

2) <u>Iqtiran</u> and <u>gird amadan</u> both mean "bringing together," "combining,"

and <u>iqtiran</u> has in the literature usually been translated as "conjunc-

tion." Intrinsically this translation is unobjectionable, and the

concept would seem to be valuable and an important one (from the

point of view of truth functions) as well as useful in distinguishing

<u>qiyas iqtirani</u> (syllogisms of liason) from detachmental syllogisms

or <u>qiyas istethnai'</u>.

However, the following are to be noticed:

a) Why does he introduce the word here and not when he talks about

simple and compound propositions, or when he talks about disjunctive

propositions? (P. [34]ff) Since the conjunction of the two premisses

results in a compound proposition, each of whose components is itself

a proposition, so the process of conjoining two propositions would not

seem to be granted only in the case of categorical syllogisms. This

is also borne out by the fact that he considers 'p∨q' and 'p⊃q' as
justified combinations of propositions irrespective of their occurrence
in syllogisms. However, it may be argued that, given the textual
placement of the definition of iqtiran, iqtiran is usable and meaningful,
only with respect to an offered syllogism, as a distinguishing feature
of one type of syllogism from another (i.e., syllogisms of liason from
detachmental syllogisms). But on this basis it is easily seen that
this device, although descriptive of what happens with respect to
the premisses of categorical syllogisms, is equally descriptive of
what happens with respect to the premisses of detachmental syllogisms
and hence fails to distinguish one from the other. For, presumably,
what is meant here is that a conjunction of premisses of a categori-
cal syllogism leads necessarily to the conclusion, i.e.,

$$\text{All S is P}$$
$$\underline{\text{All P is K}}$$
$$\therefore \text{All S is K}$$

which may also be written 'P.Q/∴R' to show the structure. But equally

$$\text{p⊃q}$$
$$\underline{\text{p}}$$
$$\therefore \text{q}$$

may be written '(p⊃q).p/∴q'. In the latter case, also, there is
iqtiran of two premisses as it was in the former case and as it will
be in any argument-type.

b) The other puzzling thing is that he defines "figure," with respect
to the manner of this combination, which is very strange, since the
figure of a syllogism depends on the position of the middle term per
the conclusion as he himself says on p. [48], LL. 16-17.

Thus, if _iqtiran_ is taken to mean "conjoining" or "conjunction,"
then it is difficult to see what the "manner (or mode) of conjunction"
has to do with figures. Indeed, it is difficult to interpret the
phrase "manner of conjunction;" what does "manner" mean here? There
is only one way of conjoining premisses, i.e., with an "and." (Note:
iqtiran is v. n. 8 of _QaRaNa_. Goichon in _Vocabulaires_, p. 26, gives
one translation as "liason" and also says that _iqtiran_ is synonymous
with _shakal_, but this latter synonymity is not implied by the _Dānish_.)

If, on the other hand, _iqtiran_ is translated as "liason," a
simple solution to these problems and a solution that is consistent
with the rest of the discussion on _iqtirani_ syllogisms emerges, for
now the lines in question read: "and the bringing together of these
two premisses is called _liason_ (or alternatively, establishing a
liason), and the way this bringing together is done is called figure...."
What this _liason_ is, is now clearly seen: it is a connection between
two propositions (premiss in case of a syllogism) by virtue of their
sharing a term (there being a _juz_ common to both, p. [47], L. 15);
it is not a connection by virtue of a conjunction, e.g., "and,"
"but," etc. This _liason_ , then, is established by means of a _common_
term, which is always the middle term (p. [48], L. 5). So now "_the_
way this bringing together occurs" (p. [48], L. 13-14) is a function
entirely of the relative position in the two premisses that the
middle term occupies. This in turn means that "figure," which is
defined as "the way this bringing together occurs" (p. [48], L. 14),
depends on the position (relative positions in the two premisses)
of the _middle term_ as it should and as implied by Avicenna himself on
p. [48], LL. 16-17, and p. [49], LL. 1-2. Hence, interpreting _iqtiran_,

not as a conjunction of two propositions, but rather as a liason estab-
lished between the two premisses by means of a common term, avoids the
problems raised in both a) and b) above. At the same time this inter-
pretation distinguishes syllogisms of liason, in which no conclusion
can be drawn without considering this liason between the two premisses,
from detachmental syllogisms, where a conclusion is drawn independently
of the presence or absence of any shared terms. (See p. [46], LL. 3-9,
where in LL. 7-8 the common juz is not a term but a proposition.)

^{163}p. [48], L. 16 - p. [49], L. 2. Recalling the arrangement of
premisses in a syllogism from note 161 above, we have:

Minor premiss: All S is M

Major premiss: <u>All M is P</u>

Conclusion: All S is P

Since it is clear from p. [48], LL. 13-14 that the syllogistic
figures are defined without regard to the quantity and quality of the
propositions involved and only with respect to the position of the
middle term (p. [48], L. 16 - p. [49], L. 2), we may achieve greater
perspecuity in the recognition of the figures if we let α stand for
the major term, β stand for the minor term, and μ stand for the middle
term. Then the following diagrams will show the position of the terms
in each of the figures:

First Figure	Second Figure	Third Figure
βμ	βμ	μβ
<u>μα</u>	<u>αμ</u>	<u>μα</u>
βα	βα	βα

Where α = major term

β = minor term

μ = middle term

It will be noticed that Avicenna recognizes three figures

only.

[164] This passage presents great difficulties in that we do not

know which rule Avicenna has in mind since he does not tell us.

[165] We might tabulate Avicenna's rules for syllogisms of liason

thus:

Rule 1 (R1): Two Negative propositions do not yield a syllogism.

Rule 2 (R2): Two Particular propositions do not yield a syllogism.

Rule 3 (R3): Purported major premiss being a Particular proposition

and the purported minor premiss being a Negative

proposition do not yield a syllogism.

This seems to be a partial list of rules for syllogisms of liason,

as there is no mention of distribution rules, nor have we found later

in the text any specific mention of them.

Following the usual formulation of these rules in the literature,

the first rule given by Avicenna should read: No conclusion can be

drawn from two negative premisses.

It will be noticed that Avicenna's formulation of the three rules

is without reference to conclusion. This is not an omission, since

Avicenna's definition of a syllogism, which is offered in two different

places (p. [45], LL. 1-13 and p. [47],LL. 3-6) and according to which

a syllogism must have three propositions (two of which necessitate the

third), makes the mention of the conclusion in these rules superfluous.

For, according to his definition, to say that two given propositions

do not yield a syllogism is tantamount to saying that no conclusion from

the two propositions is forthcoming. Granting that the statement "the

syllogism is a form of deductive argument in which granting the truth

of two propositions (called the premisses), the truth of a third pro-
position (the conclusion) necessarily follows" (Brennan, A Handbook
of Logic, p. 49.), is fairly representative of the traditional defi-
nition of a syllogistic argument, it is easily seen that the tradi-
tional formulation of the two rules introduces an ambiguity as to
what is to count as a syllogism. For they imply that two negative
premisses do constitute a syllogism, except that "no conclusion can
be drawn from them," and similarly for two particular premisses. Where-
as, according to Avicenna's formulation of these rules, it would seem
that two negative propositions taken together and two particular pro-
positions taken together cannot even serve as premisses, since he
doesn't speak in terms of muqaddima (premiss), on p. [49], LL. 5-6,
but says only "two.negative(s)" and "two particular(s)." If it is
objected that since he uses neither the term "propositions" nor the
term "premisses" and so cannot be interpreted as using the term "pro-
positions," then on the same grounds he cannot be interpreted as using
the term "premisses" either. Internal evidence, p. [48], LL. 9-10,
indicates that a proposition may be called a premiss only in relation
to an argument. This is not denying that any proposition may serve
as a syllogistic premiss, but this is claiming that whether a propo-
sition is actually a premiss will depend on whether there actually is
a syllogistic argument whose premiss a given proposition is. But in
the present case he says, in no uncertain terms, that there is no
syllogistic argument at all (p.[50],LL.5-6). Thus, it is impossible
that he could have used "premisses." Therefore, he must be interpreted
as using "propositions." Since we have shown that, according to Avi-
cenna, neither two negative propositions taken together nor two

particular propositions taken together can be premisses, and since he himself states that neither of these two combinations yields a syllogistic argument, it is obviously superfluous to talk in terms of a conclusion. Hence, his formulation of the rules is not only accurate but also avoids any contraverting his definition of the syllogism.

In the third rule we meet for the first time the traditionally accepted Arabic terms sughra (صغرى) and kubra (كبرى), meaning "minor" and "major" respectively. The switch to Arabic terminology is hard to explain in light of the fact that he has available the Persian terminology on p. [48], LL. 11-13. This switch cannot even be explained by appealing to variant readings in manuscripts, since none of the manuscripts consulted are at variance with regard to the terminology in the lines under discussion.

The third rule taken as a whole prohibits the formulation of a syllogism, whose purported minor premiss would be a negative proposition and whose purported major premiss a proposition which is particular. In other words, the following combinations as leading to a syllogism are ruled out (in each case the major is written first):

1. I O

2. I E

3. O E

4. O O

It is to be noticed that:

I O is also ruled out by R2.

O E is also ruled out by R1.

O O is also ruled out by R1.

Thus, the third rule is necessary only for disallowing the IE combination. The third rule is impossible to justify without appeal to distribution rules, and, as stated above, Avicenna does not specifically mention them.

The next question we must ask is are these rules sufficient for the forming of syllogisms of liason as well as for judging their validity. Avicenna, however, has not claimed the latter.

Leaving the consideration of figures aside there are sixty-four possible moods of the categorical syllogism:

					R1		R1		R3	R2
AAA	AEA	AIA	AOA	EAA	EEA*	EIA	EOA*	IAA	IEA*	IIA*
AAE	AEE	AIE	AOE	EAE	EEE*	EIE	EOE*	IAE	IEE*	IIE*
AAI	AEI	AII	AOI	EAI	EEI*	EII	EOI*	IAI	IEI*	III*
AAO	AEO	AIO	AOO	EAO	EEO*	EIO	EOO*	IAO	IEO*	IIO*

	R2		R1	R2	R1 & R2
IOA*	OAA	OEA*	OIA*	OOA*
IOE*	OAE	OEE*	OIE*	OOE*
IOI*	OAI	OEI*	OII*	OOI*
IOO*	OAO	OEO*	OIO*	OOO*

In the above lists, the asterisked combinations are those that are ruled out by the rule, or rules, that head that column.

All OO's may be dismissed by R1, also by R2, and also by R3.

All EE's may be dismissed by R1.

All II's may be dismissed by R2.

All IO's may be dismissed by R2 and also by R3.

All OE's may be dismissed by R1 and also by R3.

All EO's may be dismissed by R1.

All OI's may be dismissed by R2.

All IE's may be dismissed by R3.

It is to be noticed that the Avicennian rules eliminate just exactly those combinations of purported premisses from which, by his definition of a syllogism, a syllogism cannot even be formed (in traditional and usual terms, those combinations of premisses from which no conclusion can be drawn, that is to say, syllogistically impossible combinations). The remaining list contains combinations that are invalid, but it should be recalled here that Avicenna did not offer these rules in order to distinguish valid forms from invalid forms but only to discriminate, in light of his definition of a syllogism of liason, between possible and impossible syllogistic forms, and this latter task, as we have shown, his rules do accomplish.

[166]Meaning [syllogistic moods].

[167]What is meant here is that arguments in the first figure exhibit all the four types of propositions in their conclusions. That is, the type of proposition that may occur as a conclusion in the first figure is not restricted to any particular type of proposition. That is to say the following combinations are possible:

> AAA
> EAE
> AII
> EIO
>
> (AAI) ⎫
> (EAO) ⎬ These two have weakened conclu-

sions (they could just as well have been AAA and EAE; this fact, however, does not detract from what Avicenna notices about the first figure).

[168]This seemingly cumbersome way of giving the skeleton of the argument has been encountered before on p. [43], LL.7-16. It is quite obvious that the syllogistic form intended here is AAA (in the first figure).

Every B is C

<u>Every A is B</u>

∴ Every A is C

As against the example given in (ى) below, we have, above, put the example in standard form. Indeed, the manuscript (ى) gives this form by utilizing term variables:

هر آب است وهربـاج نتيجه دهد كه هر آ ج است

and the cumbersome expression could be avoided by adopting this read-ing; however, in subsequent pages, it will be seen that not even manuscript (ى) returns to the use of ج , ب , آ or any other letters to indicate various syllogistic forms, thus for the sake of consistency it was thought better to retain the cumbersome expressions throughout.

[169]P. [52], L. 11.

1) He should not say that "No thus is so" is true. What he should have said is that "No thus is so" is <u>assumed</u> to be true and this, of course, given his definition of a syllogism, is what he means.

2) It should be noticed that "No thus is so," etc., is not really a proposition but only a propositional function. It can, of course, be made into a proposition by replacing the place holder's 'thus' and 'so' by genuine terms; the resulting proposition may then be judged to be true or false. His discussion of propositions (P. [25]ff) syllogisms (P.[45]ff) indicates that he is aware, although he does not say so explicitly, that he is dealing with dummy propositions. In this particular case, and in previous and subsequent cases, however, there is very little or no chance of any confusion arising from the

fact that he terms "No thus is so" and other such dummy propositions as true or alternatively as false.

170P. [52], L. 15.   Here it would seem proper to translate "درست" as "valid," and such a translation would certainly be acceptable under current practice in logic. I have, however, preferred "correct" to "valid," because the internal textual evidence indicates that Avicenna does not entertain the dual concepts of "validity" and "invalidity." As has been discussed in note 165 (P. [49], LL. 5-8), for Avicenna those syllogisms that we would call invalid would simply not be syllogisms at all; for him a syllogism always necessarily yields its conclusion or it is not a syllogism at all.

171P. [54], L. 5.   To be consistent with the rest of the paragraph, the Persian should be " برخی فلان بهمان نیست ," but there is no support for such a reading in any of the manuscripts. Only the manuscript B comes close to such reading, but in this manuscript, although " برخی فلان " is present, it is followed by " بهمان است " rather than by " بهمان نیست ", which is ample reason to reject it. For the above reasons نه هر فلان بهمان است is retained. Avicenna uses this form to express particular negative (O) propositions often. But this poses no real problem, since the English "Not every A is B" (which is a translation of " نه هر فلان بهمان است ") is equivalent to "Some A is not B" which fact the English translation reflects.

It is also to be noted that " نه هر فلان بهمان است " is itself equivalent to " برخی فلان بهمان نیست ;" the latter form is importantly and centrally employed on p. [55], L. 5.

172See p. [54], LL. 6-10.

[173] See p. [60], LL. 4-7.

[174] An alternative reading would be, "If it is not the case that every such is so, then not-every such is thus."

[175] This is the '∼∼q' of '[(p⊃∼q)·∼∼q]/∴∼p.'

[176] Not every such is thus: نه هرنلانی بهمان است

[177] Every thus is so: نه هربهمانی باستار است

BIBLIOGRAPHY

BIBLIOGRAPHY

Afnan, S. M. Avicenna: His Life and Works. London: George Allen and Unwin, 1958.

Aristotle. The Categories (The Loeb Classical Library). Edited and translated by Harold P. Cook, Cambridge: Harvard University Press, 1938.

Aristotle, The Metaphysics (The Loeb Classical Library). Translated by Hugh Tredennick, Cambridge: Harvard University Press, I' 1933, II' 1935.

Aristotle, On Interpretation [De Interpretatione] (The Loeb Classical Library). Edited and translated by Harold P. Cook, Cambridge: Harvard University Press, 1938.

Aristotle. Posterior Analytics (The Loeb Classical Library). Translated by Hugh Tredennick, Cambridge: Harvard University Press, 1960.

Aristotle. Prior Analytics [Analytica Priora] (The Loeb Classical Library). Edited and translated by Hugh Tredennick, Cambridge: Harvard University Press, 1938.

Aristotle. Topica (The Loeb Classical Library). Translated by E. S. Forster, Cambridge: Harvard University Press, 1960.

Avicenne [Ibn Sina]. Le Livre de Science (Logic, Metaphysique); The French translation of Dānish Nāmeh-e 'Alāī. Translated by Mohammad Achena and Henri Massé, Paris: Société D'Edition "Les Belles Lettres," 1955.

al-Bayhaqi. Tatimmat ṣiwān al-ḥikmah: Tārīkh ḥukamā' al-Islām. Edited by M. Kurd 'Ali, Cairo: 1946.

Bocheński, I. M. Ancient Formal Logic. In the series "Studies in Logic and The Foundations of Mathematics," Brouwer, Beth and Heyting, editors, Amsterdam: North-Holland Publishing Company, 1963.

Brennan, Joseph G. A Handbook of Logic. Second edition, New York: Harper and Row, 1961.

British Museum: manuscript consulted. Persian manuscript. [Noted as Ms. B] Or. 16,830.

British Museum: manuscript consulted. Persian manuscript. Add. Ms. 16,659.

Brockelmann, Carl. Geschichte der arabischen Litteratur. Vol. I, second
     edition, Leyden: 1943. Note also Supplementband I, 1937, Vol. II,
     second edition, 1949, Supplementband II, 1938, and Vol. III, 1942.

Browne, E. G. A Literary History of Persia. 2 volumes, New York:
     Scribners, 1906.

Dahkhoda, 'Ali Akbar. Loghat Nāmeh. 34 volumes, Tehran: The Majlis
     Press, 1325 Sh.M.

Ethé, Herman. Catalogue of Persian Manuscripts in the India Office
     Library. Vol. I, London: Oxford University Press, 1903.

Freeman-Grenville, G. S. P. The Muslim and Christian Calendars.
     London: Oxford University Press, 1963.

Gauhareen, Syed Sadiq. Hujjat al-Haq Abu 'Ali Sina. Tehran: Kitab
     Khana-e Iran, 1331 Sh.M.

Goichon, A. M. La Philosophie d'Avicenne et son influence en Europe
     médiévale. Paris: Librairie d'Amérique et d'Orient, Adrien-
     Maisonneuve, 1951.

Goichon, A. M. "L' evolution philosophique d'Avicenna," Revue philoso-
     phique de la France et de L'etranger, 138 (1948) pp. 318-329.

Goichon, A. M. Lexique de la Langue philosophique d'Ibn Sina. Paris:
     Desclee de Brouwer, 1938.

Goichon, A. M. "Une logique moderne a l'epoque médiévale la logique
     d'Avicenne," Archive d'hist. doctrinale et littéraire du
     Moyen Age. Vols. XXII-XXIII (1947-48) pp. 53-68.

Goichon, A. M. Vocabulaires compares d'Aristote et d'Ibn Sina.
     A supplement to Lexique, Paris: Desclee de Brouwer, 1939.

Gundisalvi, Domingo. Avicennae Opera. This is a reprint of the
     Venice 1495 edition, which was reissued in 1500 and 1508;
     Frankfurt am Main: 1961.

Gyeke, Godfrey Kwame. Ibn al-Tayyibs Commentary on Porphyry's
     Eisagoge. 2 volumes (unpublished Ph.D. dissertation, Harvard
     University, 1969).

Hāiri Mazenderāni, Shaikh Mohamad Saleh. Hikmat-e bu Ali Sina.
     Forward and Persian translated by 'Imād al-din Husain
     Esfahānī, known as 'Imād Zadeh; edited by Hasan Fazaili
     "Sheva"; Vol. I, Tehran [?]: Sherkat-e Sahāmi Press, 1335 Sh.M.

Hāji Khalīfah, Mustafa ben 'Abdallah Katib Jelebi. Kashf al-Zunun
     'an asāmī al-kutub wa al-fūnūn. (Latin: Lexicon Biblio-
     graphicum et Encyclopaedicum), 7 volumes. Edited and translated
     by G. Flügel, Leipzig: 1835-1858.

Hamilton, Sir William. Lectures on Logic. Edited by Henry L. Mansel and John Veitch, Boston: Gould and Lincoln, 1863.

Ibn Abi Uṣayhi'ah. Uyūn al-anbā' fi tahaqāt aṭibbā.' Edited by A. Müller, 2 volumes, Cairo: 1882.

Ibn Sina, Abū 'Alī. Dānish Nāmeh-e 'Alai. Edited by Ahmad Khurāsānī. This work consists only of the Metaphysics; Tehran: 1936.

Ibn Sina, Abū 'Alī. "Elāhīyāt" section in Dānish Nāmeh-e 'Alāī. Edited by Muhammad Moin. Anjuman Āthār-e Milli Publication, number 14, Tehran: 1952.

Ibn Sina, Abū 'Alī. Ishārāt wa Tanbīhāt. Edited by Ehsan Yar Shatir. This work is a Persian translation of the Arabic by an unknown translator; Tehran: Anjuman Athār-e Milli, 1954.

Ibn Sina, Abū 'Alī. Kitāb al-Hudūd. Edited and translated by A. M. Goichon, Cairo: L'Institut français d'archeologie orientale, 1963.

Ibn Sina, Abū 'Alī. Kitāb al-Najāt. Edited by Kurdī, second edition, Cairo: 1938.

Ibn Sina, Abū 'Alī. Livre des Directives et Remarques. Translated by A. M. Goichon. This work is the French translation of Ishārāt wa Tanbīhāt. Paris: Libraire philosophique J. Vrin., 1951.

Ibn Sina, Abū 'Alī. Mantiq al-Mashriqiyīn. Edited by Muhib al-din Khatīb and Abdal-Fatah al-qatlan, Cairo: Al-Mu'id, 1910.

Ibn Sina, Abū 'Alī, Māyah-e Dānish-e 'Alāī. Edited by Syyed Asadullah. This is an edition of Dānish Nāmeh-e 'Alāī under another title, Hyderabad (Deccan): Maṭli'a Ferouz, 1891.

Ibn Sina, Abū 'Alī. "Risala Mantiq" section in Dānish Nāmeh-e 'Alāī. Edited by Mohammad Moin and Syed Mohammad Mishkat. Anjuman Athā-e Milli Publication, number 12, Tehran: 1952.

Ibn Sina, Abū 'Alī. "Tabīyyāt" section in Dānish Nāmeh-e 'Alāī. Edited by Syed Mohammad Mishkat. Anjuman Āthār-e Milli Publication, number 13, Tehran: 1952.

India Office Library: Manuscript consulted. Persian Manuscript [Noted as Ms. A.] Ethé 2218:I.O.478.

Khwansari, Muhammad Baqar. Rūzāt al-Jannāt. Third printing; Tehran: n.d.

Kneale, William and Martha. The Development of Logic. Oxford: The Clarendon Press, 1962.

Leonard, Henry S. Principles of Reasoning. New York: Dover Publications, 1967.

Madkour, Ibrahim. L'Organon d'Aristote dans le monde arabe. Second edition, Paris: Librairie philosophique J. Vrin, 1969.

Maimonides, Moses. Maqalah fi Sinaat al-Mantiq. Edited and translated by Israel Efros, New York: American Academy for Jewish Research, 1938.

Miller, Barnette. The Palace School of Muhammad the Conqueror. Harvard Historical Monographs No. XVII. Cambridge: Harvard University Press, 1941.

al-Nadim [Ibn al-Nadim], Mohamad ibn Ishaq. Kitab al-fihrist. Translated and edited by Bayard Dodge, 2 volumes, New York and London: Columbia University Press, 1970.

Nafisi [Naficy], Said. Sarguzasht-e Ibn-e Sina. Avicenna's autobiography and Abu Ubaid al-Wahid Jozjani's continuation in Arabic with Persian translation, edited and translated by S. Nafisi, Tehran: Anjuman Dostdaran-e kitab, 1952.

Nafisi [Naficy], Said. Zendegi wa kar wa andesha-e roozgar-e pur-e Sina. Tehran: 1954.

Nasr, Seyyed Hossein. Three Muslim Sages. Cambridge: Harvard University Press, 1964.

Padover, S. K. "Muslim Libraries," in The Medieval Library. Edited by James Westfall Thompson, Chicago: The University of Chicago Press, 1939.

Peters, F. E. Aristotle and the Arabs. New York: New York University Press, 1968.

Prantl, Carl. Geschichte der Logik im Abendlande. 4 volumes, Leipzig: 1885.

al-Qifti, Tarikh al-hukama'. Edited by J. Lippert. Leipzig: 1903.

al-Qifti, Tarikh al-hukama'. An eleventh-century Persian translation from the Arabic by an unknown translator, edited by Behman Darai', Tehran: Tehran University Press, 1347 Sh.M.

Quine, Willard Van Orman. Methods of Logic. New York: Henry Holt & Co., 1950.

Rescher, Nicholas. The Development of Arabic Logic. Pittsburgh: University of Pittsburgh Press, 1964.

Rescher, Nicholas. Studies in the History of Arabic Logic. Pittsburgh: University of Pittsburgh Press, 1963.

Rieu, Charles. Catalogue of the Persian Manuscripts in the British Museum. Vol. II. London: Gilbert and Rivington, 1881.

Rizwānī, Akbar. *Abū 'Ali Sina*. Tehran: Mohammad 'Ali 'Ilmi Press, 1344 Sh.M.

Rypka, Jan. *Iranische Litteraturgeschichte*. Leipzig: Otto Harrassowitz, 1959.

Safā, Zahīhollah. *Tarīkh-e Adabiyyāt dar Iran*. Tehran: Kitab Farooshi Ibn-e Sina. Fourth printing 1961, first printing 1958.

Sajjadi, Seyyed Jāfar. *Ferhang-e Uloom-e 'Aqali*. Tehran: Kitab Khana-e Ibn Sina, 1341 Sh.M.

Steinschneider, Moritz. *Die arabischen Übersetzungen aus dem Griechischen*. (A collection of articles first published in the following journals, *Beihefte zum Centralblatt für Bibliothekswesen* V, XII, Leipzig: Verlag Harrassowitz, 1889, 1893; *Zeitschrift der Deutschen Morgenlandischen Gesellschaft*, Bd. 50, Leipzig: F. A. Brockhaus, 1896; *Archiv für pathologische Anatomie und Physiologie und für klinische Medizin*, Bd. 124, Folge XII, Bd. IV, 1891, Berlin: Verlag Georg Reimer.) Graz: Akademischen Druck-U Verlagsanstalt, 1960.

Weisweiler, Max. "Avicenna und die Iranischen Fürsten Bibliotheken Seiner Zeit," *Avicenna Commemoration Volume* (pp. 47-63); Calcutta: Calcutta Iran Society, 1956.

Wolfson, Harry A. "The Internal Senses in Latin, Arabic, and Hebrew Philosophic Texts," *Harvard Theological Review*, Vol. XXVIII, No. 2 (April, 1935), pp. 69-133.

Wolfson, Harry A. *Religious Philosophy: A Group of Essays*. New York: Atheneum, 1965. (Originally published by Harvard University Press, 1961.)

Wolfson, Harry A. "The Terms Taşawwur and Taşdīq in Arabic Philosophy and Their Greek, Latin and Hebrew Equivalents," *The Moslem World*, 33 (1943), 114-128.

Zeller, E. *Aristotle and the Earlier Peripatetics*. Translated by B.F.C. Costelloe and J. H. Muirhead. 2 volumes, London: Longmans, Green & Co., 1897.