Ibn Sīnā on Logical Analysis

Wilfrid Hodges and Amirouche Moktefi

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2.1 Language-meaning correspondence

All of Ibn Sīnā's logic, and a large part of his metaphysics and his psychology, is based on a theory of language and meanings. We can summarise it as follows.

There are meanings. Meanings are objective entities; they have whatever properties they have independently of any acts of ours. But they are not perceptible or even imaginable. Sometimes we draw pictures in the world or in our minds in order to represent the content of descriptive meanings; but these representations are not themselves meanings.

The role and purpose of human languages is to provide perceptible tokens to stand for meanings. We need these tokens for two reasons. The first is that in our reasoning, even our silent mental reasoning, we operate with tokens and not with raw meanings. (As some modern cognitive scientists put it, we are 'symbol processors'.) The second is that we don't have telepathy, and so to convey meanings from person to person we have to use perceptible tokens that stand for the meanings.

Some meanings are atomic, other meanings are compound and are built up by putting together atomic meanings. Ibn Sīnā compares compound meanings with a house. The house is built by laying down foundations and then successively attaching the parts of the house; compound meanings are built in an analogous way. Languages rely on the form of this construction. At first approximation, languages have single words as tokens for atomic meanings, and they have syntactic constructions that correspond to ways of attaching one meaning to another. So the syntax of a sentence is a reflection of the structure of the meaning of the sentence. A word or phrase 'signifies'

(*yadullu ᶜalā*) the meaning to which it corresponds.

But the correspondence between the structures of sentences and the structures of their meanings is not exact. We can see this by comparing how the same meaning is expressed in different languages. For example the corresponding words may appear in different orders in two different languages, suggesting that the underlying meanings don't have a 'natural' linear order. But also we can see from examples in a single language that the correspondence sometimes becomes distorted. This happens in various ways, but one of the most significant is that for reasons of economy we sometimes leave out of the sentence parts of the meaning that we have in our mind. It's reasonable for us to do this when we believe that our reader or hearer can reconstruct the missing parts of the meaning from the context of utterance and knowledge of linguistic usage.

That in a nutshell is Ibn Sīnā's view of the relation between language and meanings. He has a great deal more to say about it, and this book will spell out many of the details. Similar broad pictures of this relation started to appear in the Aristotelian tradition by the tenth century at latest, and they survive in some quarters today. One of us has used the name 'Aristotelian compositionality' for the broad picture REF. Aristotelian compositionality should be distinguished from the more abstract notion of compositionality that we meet in followers of Tarski and Chomsky, which asserts that there is a kind of homomorphism from syntax to meanings. The distinctive feature of Aristotelian compositionality, which is completely absent from the modern abstract compositionality, is the idea that meanings have parts that are also meanings, just as phrases of a language have parts that are also phrases. Gottlob Frege's compositionality was expressed in terms of parts of meanings, and in general it seems fairly close to Ibn Sīnā's view.

We don't know how far Ibn Sīnā's Aristotelian compositionality was his own invention. In the previous century Al-Fārābī had expressed similar views:

But there are at least two reasons for suspecting that these views were not original with Al-Fārābī. The first is that a version of Aristotelian compositionality appeared in the 12th century in writings of Abelard REF. There is no known channel of transmission from Al-Fārābī to Abelard. So one suspects that some version of the idea appeared in some Roman Empire commentators, though as yet we have no direct evidence of this.

The second reason for suspecting that Al-Fārābī is not the source of the idea is that Al-Fārābī seems to have a rather shallow grasp of it. First, he presents the correspondence as a fact, without saying anything about what

it does for us. He never explains, for example, what role it plays in thinking or in communication. (At least, never in his writings that have survived.) And second, he mentions that there are several syntactic constructions in natural languages, but he spells out the details of the correspondence only for one of them, namely conjunction. REF IN ALFAZ. Ibn Sīnā is quite the opposite; as we will see, he is overwhelmed by the variety of different syntactic constructions and the implications that this has for the study of meanings. (Al-Fārābī was deeply interested in language, but his syntactic thinking was mostly at the level of word classes. Roughly speaking, in syntax Al-Fārābī is to Ibn Sīnā as Dionysius Thrax is to Apollonius Dyscolus; though Apollonius himself was unknown to the Arabs.)

2.2 Noun-type meanings

Ibn Sīnā is not very good at setting out the foundations of logic. Why should he try? — for him the foundations of logic are things that we all know anyway. So the job of the expositor is not to define the basic notions — they are too basic to be defined — but to provide a suitable vocabulary for talking about them. The best way for the expositor to do that is by example, providing his own discussion of the basics and allowing us to familiarise ourselves with the appropriate turns of phrase. So Ibn Sīnā simply launches in, without any of the preliminary explanations that we would expect today. He will have relied on his readers having some experience of philosophical discourse, perhaps through reading Al-Fārābī.

One of Ibn Sīnā's most fundamental notions is what he calls *šay'*, literally 'thing'. (The plural is *ašyā'*.) Usually he doesn't define it. But in *Najāt* we do find a kind of definition, though its content and context show that it is meant as a paraphrase of the opening paragraph of Aristotle's *De Interpretatione*:

(2.1)   A *šay'* is an existing individual, or a form existing in the *wahm* or the intellect and taken from the individual, . . . ; or a spoken expression that signifies the form in the *wahm* or the intellect . . . . (*Najāt* 18.7)

The crucial notion of *šay'* is what he here calls the 'form existing in the intellect'. The rest of the definition is more of an explanation of how *ašyā'* come into our intellects in the first place. Thus we see an individual horse, we build up a mental picture of it in the *wahm* (the 'estimative faculty', which among other things houses the mental pictures that we use for classifying

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things). Then we abstract from the picture, removing everything that distinguishes one horse from another, like colour or size. Ibn Sīnā thought he found a description of some such process in Aristotle, and he accepted it. Fortunately for us, Ibn Sīnā regards questions of how *ašyā'* get into the mind as irrelevant to logic. So all we need to remember from this account is that a typical example of a *šay'* is [HORSE], the meaning of the word 'horse'. At the end of the passage quoted, Ibn Sīnā adds that the word 'horse' itself counts as a *šay'*; though in practice this is not his usage. But probably he is warning the reader that the correspondence between words and their meanings often allows him to be rather careless about which of the two he is talking about.

In his logical writings Ibn Sīnā virtually never uses *šay'* to mean 'existing individual'; he has other words and phrases for that. So it would be highly misleading to translate *šay'* as 'thing', at least when he is using it as a technical term. Instead we have translated it as 'idea'. (But often it is just a word of everyday Arabic, as in the phrase *lā šay'a* for the quantifier 'nothing'. In these cases 'thing' is the natural translation.)

= 'things': descriptive content, constitutives.
X-bar theory and *taqyīd* (not in detail)

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the two cases of absolute and necessary

{*Prior Anal* i.4, 25b26}

[2.4.1] /106/ These things that we have been discussing [(i.e. proposi-   106.4
tions)] are referred to as 'premises' when one intends to study them as parts
of a syllogism. We assert that a [proposition] that follows from a syllogism   106.5
falls into one of two cases. The first case is that neither the proposition nor
its contradictory negation is mentioned explicitly in the syllogism; syllo-
gisms of this kind are called 'recombinant'. An example is when you say

(8.1)
> Every animal is a body,
> and every body is a substance,
> so every animal is a substance.

The second case is that the proposition or its contradictory negation, or
more generally one of the two polarities of the goal, is mentioned in it
explicitly in some way. I call these [syllogisms] 'duplicative', though the
common name for them is 'conditional'. The reason I don't call them con-
ditional is that some conditional [syllogisms] are in fact recombinant (??).   106.10

[2.4.2] Let us start with the recombinant [syllogisms]. Some of them   106.11
[are predicative, i.e. they] consist of predicative [propositions]. We as-
sert that every simple predicative recombinant syllogism is composed of
two premises which share a term, like the shared term 'body' the example

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above. This term can be in one of the two [premises] as predicate and in the other as subject; or it can be predicate in both; or it can be subject in both. When this term is the subject in one and the predicate in the other, then there are two cases. It can be /107/ predicated of [the term that is] the subject of the goal and subject for [the term that is] the predicate of the goal; this case is called 'the first figure'. Or else it can be predicated of the predicate of the goal and subject for the subject of the goal. But when I come to discuss it, I will eliminate this figure on grounds of deficiency, though it had to be included in the classification.

[2.4.3] When people classified the figures according to the threefold classification that we mentioned, where syllogisms come in three forms, they identified one of these parts as being the first figure, and they took it as being the one whose middle term is a subject in one of the two premises and a predicate in the other. But then when they considered any specific premise pairs that presented themselves (idiom??), they took 'first figure' to mean that the term that serves as subject for the middle term remains a subject in the conclusion, and the term that serves as predicate for the middle term remains a predicate in the conclusion. This is a narrower meaning than the one originally assigned for this figure. Then because they counted the first figure not as the one satisfying the general condition that the middle term occurs both as subject and and predicate, but where fthe middle term is predicate of the subject of the goal. and subject of the predicate of the goal, they devised a fourth subdivision. The best of doctors mentions this fourth figure, but he doesn't take the view that we do. Here we reject it because it is unnatural, unreasonable and inappropriate for the conduct of the enquiry and reflection. And it is not needed, thanks to the possibility of converting the conclusion of [a syllogism] in first figure; we will explain this elsewhere.

107.7 NB 'They take X *min ḥaytu* ϕ' here means 'They take X to mean that ϕ'.

107.9 Should be *anna* rather than *li-anna*, shouldn't it?

107.13 Is this a reference to 110.6ff?

[2.4.4] So let the first figure be what we said it is. The second figure is   107.13
the one in which the middle term is predicated of both the two extreme
terms. The third figure is where the middle term is subject for both the   107.15
extreme terms. The extreme term which is the subject of the goal is known
as the 'minor term', and the premise which contains /108/ this extreme
term is called the 'minor premise'. The extreme term which is the predicate
of the goal is called the 'major term', and the premise that contains this
extreme is called the 'major premise'. A composition of two premises is
called a 'premise-pair'. The thing from which the conclusion has to follow
intrinsically is called a 'syllogism'. The format of the relation between the
middle term and the two extremes is called a 'figure'. The thing that follows
is called the 'goal' while we are still making our way towards it through the
syllogism. Then when it has followed, it is called the 'conclusion'.   108.5

[2.4.5] The first figure is put as the first figure just because the fact that its   108.5
conclusion follows is self-evident, and the syllogisms in it are perfect. An-
other reason is that it entails each kind of goal, whereas the second figure
entails only negative propositions, and the third figure entails only existen-
tially quantified propositions. Moreover it entails goals of the best kind,
namely universally quantified affirmative propositions.

[2.4.6] Know that: 108.8

1. There is no syllogism from two negative propositions,

2. Nor is there from two existentially quantified propositions.

3. The minor premise is not negative [[unless it is a contingency propo-
   sition]].

4. The major premise is not existentially quantified.

5. And know that the conclusion follows the worse of the two premises,
   not in every respect, but in quantity and quality though not in modal-   108.10
   ity.

You will learn these things later as we consider the separate cases.

108.3 The *li-ḏātihā* refers back to *bi-ḏātihā* in the definition of syllogism at
54.7.

108.9 NB This is a typo for the peiorem rule.

108.12   The first figure:

108.13   [2.4.7] Consider a syllogism in the first figure. Given that its minor premise is affirmative, [it is asserted that some or all of the things satisfying] its minor term are included among the things that satisfy the middle term. So when the major premise is universally quantified, if it affirms or denies

108.15   [the major term] of everything that satisfies the middle term, regardless of how it does so, [it follows that the things satisfying] its minor term are included among [the things that satisfy, or respectively fail to satisfy, the major term]. But if [the major premise] was not universally quantified, it could happen that [the things satisfying] the minor term escape [the major term], since it could happen that [the premises are true but] /109/ the 'some' individuals [witnessing the major premise] are not [those satisfying the minor term]. (This could happen equally well when [the major premise] is a necessity proposition or a possibiity proposition.) And if [the minor premise] didn't predicate [i.e. affirm] the middle term of the minor term, then you will find [a syllogism of the same form] with minor and middle terms such that nothing satisfies both of them; and things that are denied of both of them, and the two are disjoint. So it doesn't follow that what [the major premise] says about the middle term holds also of the minor term, regardless of whether [the major premise] is an affirmation or a denial. If the major premise is existentially quantified, then the same holds a fortiori; or rather, if the middle term is existentially quantified [in the major premise],

109.5   and the middle term is predicated of the minor term [in the minor premise], then what is said of the middle term [in the major premise] doesn't have to transfer to the minor term, since what is asserted or denied of the middle term is asserted or denied of 'some' of the middle term, so it is possible for the middle term to cover more things than the minor term, and the assertion or denial [in the major premise] is about some things that are not covered by the minor term, so the assertion or denial is about things not satisfying the minor term, and we are in the situation discussed earlier. So it is clear that when the minor premise is negative and the major premise is existentially quantified, the premises don't entail a conclusion. We should

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109.3 We surely want things that are true of all of one but none of the other?

109.6 NB Here the quantifier is definitely part of the *ḥukm*.

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stop there and not bother to enumerate the moods that are unproductive 109.10
because no determinate conclusion follows from them. When you have
understood what we said earlier, you can give examples of such moods.

[2.4.8] Know that unquantified propositions behave like existentially 109.11
quantified propositions, in that they can legitimately occur as minor premise
in a syllogism with an unquantified conclusion. Singular propositions be-
have like universally quantified propositions. In fact there can be a syllo-
gism in which both premises are singular, for example

(8.2)   Zayd is the father of Abdullah.

and

(8.3)   Abdulluh is this person (or the brother of ^{c}Amr).

But the conclusions will be singular. Most of the singular propositions that 109.15
are used [in syllogisms] occur as minor premises.

[2.4.9] Let us list the quantified moods. We say: 109.16

     When every C is a B;
(8.4)   and every B is an A;
     then clearly every C is an A.

/110/ And

     When every C is a B;
(8.5)   and no B is an A;
     then it's clear that no C is an A.

And

     When some C is a B;
(8.6)   and every B is an A;
     then it's clear that some C is an A.

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109.16 BARBARA

110.1 CELARENT

110.2 DARII

And

> When some C is a B;
(8.7)   and no B is an A;
> then it's clear that not every C is an A.

[2.4.10] This is the first figure and its quantified moods are these four, and their conclusions are these. And three of these syllogisms can be taken to have consequences that are converses of the ones above. If you make syllogisms with these conclusions, the syllogisms aren't perfect in comparison with the ones above; rather one just proves what follows from the ones above by [adding] a conversion.

110.5

110.6   [2.4.11] Suppose someone were to say that there are other productive moods besides these, namely that when either

(8.8)   No C is a B;
and every B is an A.

or

(8.9)   No C is a B;
and some B is an A.

it follows that

(8.10)   Some A is not a C.

because when you convert

(8.11)   Every B is an A.

or

(8.12)   Some B is an A.

110.2 FERIO

then it follows by a syllogism in the second figure that

(8.13)   Not every A is a C.

The answer to this is that one calls the premises major and minor just be-   110.10
cause the first contains the subject of the goal and the second contains the
predicate of the goal. When we make the premise $C\ B$ the minor premise,
where B is the middle term, then C is the minor term and it will be the
subject of the goal. Likewise A will be the predicate of the goal. And when
we said that it doesn't entail either a denial or an affirmation, we meant
that this doesn't entail any conclusion with A as its predicate. That deals
with the doubt. Even if these moods do entail a conclusion, it is not from
the major and /111/ minor premises that were posited.

[2.4.12] Nevertheless it does reduce to a perfect syllogism through two   111.1
conversions. But this is remote from nature; it fits the [residual] subdivision
of the figures, which is invalidated by its extreme remoteness from nature.
In fact the second figure is remote from nature through having a single

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110.12 I.e. the opposite to what he's just said. We fix which is the minor
premise and which the major, and this determines the form of the con-
clusion. This is clearly what happens in practice, particularly when
the conclusion is not yet found or may not exist.

111.2 The figure that Ibn Sīnā regards as invalidated is the fourth figure,
and it's the fourth figure that we get by converting the conclusion of
a first figure syllogism. So I can't see how in this line he can be say-
ing anything other than that the two moods under consideration are
in fourth figure. This means either replacing *al-ṯānī min al-'aqsāmi l-
'arbaᶜa ti* by *al-rābiᶜati* or perhaps better *al-bāqī min al-'aqsāmi l-'arbaᶜa
ti* by *al-rābiᶜati*, or supposing that Ibn Sīnā is temporarily using a dif-
ferent ordering of the figures. See also 111.5, where except for five
listed mss that have *bāqī*, again he calls this the second subdivision.

111.3 In (110.7) he goes from 'No C is a B' and 'Every B is an A' to 'Some
A is not a C'. To get the major and minor premises in the right order,
this would need to be written 'Every B is an A', 'No C is a B'. So it is
in fourth figure. Converting the premises to 'Some A is a B', 'No B is
a C' gets it back to first figure but with two conversions.

111.5 premise — the major one — in the wrong order. The third figure is remote from nature though having a single premise — the minor one — in the wrong order. When the remoteness occurs in just one [premise], the mind tolerates it and sees how to reach the target. But the residual subdivision of the figures has to have both premises altered in order to reduce it to natural form, and this is something we can do without. The best way to deal with this and similar syllogisms is to count them as invalid.

111.8   [2.4.13] The second figure:

111.9 The distinctive feature of the format of this figure is that its middle term is predicated of both extreme terms. Its distinctive productivity condition is

111.10 that in it a pair of affirmative premises is not productive. This is because one and the same predicate in [both] affirmations (for example 'body') can be predicated [truly] of two disjoint things (for example 'stone' and 'animal'), and also of things that coincide (for example 'human' and 'laugher'). A pair of negative premises is not productive either, because one and the same predicate (for example 'stone') can be [truly] denied of two disjoint things (for example 'human' and 'horse'), and of two things that coincide (for example 'human' and 'rational'). Also a pair of existentially quantified premises productive [in this figure], because one and the same predicate can be both affirmed [truly] of some of a thing and denied [truly] of some of that thing, and it can be [truly] affirmed and denied of some of /112/ two disjoint things. Nor is it productive when the major premise is existentially quantified; when [the minor premise] makes an assertion about 'Every

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111.5 For *ṯānin* read *bāqī* with several mss. Note also that a ms confuses these two words at 112.5 below.

112.1 Given the cases above, we have to show that 'Every C is a B and some A is not a B', or 'No C is a B and some A is a B', are not productive. We show it by showing that there can be (1) terms satisfying the premises and such that every C is an A, and (2) terms satisfying the premises and such that no C is an A.

112.1 Several mss felt a need to add further explanation here, though the details they add are different.

$[C]'$ and [the major premise] makes an assertion about "some A", it can be that $[A]$ is true of every $[C]$ but $[A]$ is broader than $[C]$, so that while $[A]$ is true of $[C]$ there is some $[A]$ that is not true of $[C]$; but also it's possible that $[A]$ is disjoint from $[C]$ and none of it true of $[C]$. These are the distinctive features of productivity in the second figure. But this is just the second figure, and there is a further figure. These two figures are different 112.5 in that the second figure entails conclusions that are more useful, namely universally quantified propositions, whereas the further figure entails only existentially quantified propositions. But the further figure does entail affirmative conclusions, while the second figure entails only negative ones. In fact negative universally quantified propositions are more useful than existentially quantified affirmative propositions, that's to say that they are more useful in the sciences. [The second and third figures differ also] because one can reach the first figure from it by converting its major premise, whereas from the remaining figure one can reach the first figure by converting the minor premise. So the remaining figure comes closest to the first figure in the higher of its two premises.

[2.4.14] Turning to premises that are empirical and have no necessity in their content: it is just our sense of what is right and what we take to be for 112.10 the best that calls us to consider them. [Aristotle] did not see them as providing any reasons to go beyond the range of facts that we have indicated. Nevertheless we will go further, and set out explicitly some facts that will make it impossible for us to maintain an attitude of modest acceptance. To be precise, take the negative universal absolute proposition, understood as such propositions normally are understood, so that it is understood without /113/ any condition being added — it makes no difference whether we take 'absolute' in the broader or the narrower sense. [The fact is that] there is no [productive] second figure syllogism whose composition uses such a proposition. This is because a negative universally quantified absolute proposition and the [corresponding] affirmative universally quantified absolute proposition can be both true together of the same subject. Examples

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112.9 NB 'Nobler premise': this is a very silly comment. Can it really be Ibn Sīnā speaking? But note the use of *šaraf* in *Burhān*.

113.1 Unclear whether the condition is added to the proposition or to the definition of 'absolute'.

of this already appeared in the First Teaching. Thus

(8.14)   Every human sleeps.

and

(8.15)   Every human doesn't sleep.

can be true together, because [firstly] every human sleeps, and [secondly] there are some times at which every human doesn't sleep. This holds generally, when a predicate is predicated of every individual, not permanently but at some time, and it is also denied of every individual, not permanently but at some time. The same holds if its predication is allowed not to be permanent, even if it is not affirmed that the predication is not permanent; one should know that a syllogism in this figure, with a negative absolute premise and an affirmative absolute premise, need not be productive. That is, not unless [one of three cases holds. The first is that] the negative universally quantified proposition which is used is the standard expression which — as we explained — does convert. [The second is that] the absolute proposition that is used is one whose absoluteness belongs not to the predicate but to the quantifier, where the quantifier counts as true of all the subject individuals at some particular time. [The third is that] the two propositions have a property that is difficult to take care of, namely that the time is one and the same in both of them if possible, and under the same condition if possible.

[2.4.15] But propositions that are absolute in the sense that no condition is added are not customarily used in the sciences or in debates. Rather the custom is that when negative propositions are used in any topic, one

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113.6 Unclear whether the *bal* clause means it is required not to be permanent, or just that it is not required to be permanent.

113.10 It could be not 'belongs to' but 'is attached to', though there is no attachment word.

113.11 NB Difficulty of correlating unstated conditions between the two premises.

113.12 Why the 'if possible's?

intends the condition which we mentioned. And likewise it has been cus-   113.15
tomary to use the sentence

(8.16)   Every B is an A.

with the intention that every B is an A while it is a B. So one has to pay
attention to /114/ these two usages in this figure and the next [figure]. So
let us use the negative in the standard way, since this goes best with our
purpose. We say: The productivity condition for this figure should be that
one of the two premises is affirmative and the other is negative, and that
the major premise is universally quantified.

[2.4.16] Let us mention just the moods that are productive. The first
mood: From two universally quantified premises with the major premise   114.5
negative, there follows a universally quantified negative proposition, as in:

          Every C is a B;
(8.17)   and no A is a B;
          so no C is an A.

To demonstrate it, we convert the major premise so that it becomes 'No B
is an A', and then [the syllogism] is

(8.18)   Every C is a B; and no B is an A;
          so no C is an A.

We can also prove it by way of absurdity. We say: If [the conclusion] is

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113.15 What condition did we mention? That the proposition converts?
        that the absoluteness is on the quantifier? that the times are the same
        in both cases?

114.1 Which two uses? I guess (1) the 'standard' usage and (2) the descrip-
        tional. I guess the next figure because this is partly reduced to the
        second.

114.2 See *Jadal* 153.14 for this usage of *'ajma^{c}u li-*.

114.5 CESARE, proved by converting major premise to get Celarent.

false, then let some C be an A. We had that no A is a B, and it follows by [a
114.10   syllogism in] the first figure that not every C is a B. But we had that every C is a B, and this is absurd.

114.10   [2.4.17] Now someone might well say: This is not an impossible absurdity, because you needn't get a falsehood by saying both 'Every' or 'Not every' when the propositions are absolute. In fact it's possible to have 'every' and mean by it every individual at some time, and 'not every' and mean by it every individual at some other time, and this is not an absurdity. The answer is that we have already set out the line that we are taking here in our use of the absolute. One case is where the meaning is that no A
114.15   is a B all the time that it is an A, and likewise the sentence

(8.19)   Every C is a B.

just means

(8.20)   Every C is a B for as long as it is a C.

114.9 By FERIO. For below, note that if the sentences are read descriptionally, then we have that some C is an A all the time it's a C, and there is no A that is a B all the time that it's an A (taking the weaker possible reading). Therefore there is a C that is not: B all the time it's A, but also is an A all the time it's a C. NB Nothing follows. So take the stronger reading: Every A is a non-B all the time it's an A. Now there is a C that is an A all the time it's a C; so all the time it's a C, it is a non-B. So there is a C that is a non-B all the time it's a C. This contradicts that every C is a B all the time it's a C.

114.10 NB The objection to the proof of Camestres is answered by showing that the proof works for the descriptional reading; there is no argument that it works in general.

114.14 Which way round the scope? As at 114.9 above, it has to be: Every A is a non-B all the time it's an A.

The conclusion will be /115/ that no C is an A all the time that it is a C. But this can't be true at the same time as the statement 'Some C is an A for as long as it is a C', and so this is an impossible absurdity.

[2.4.18] [Returning to the main argument,] the reason for [the absurdity] is either that the syllogistic format is not productive, or that the premises are false. But the premise-pair is productive and the sentence 'No A is a B' is posited as true. So the remaining possibility holds, namely that the reason for the absurdity is the falsehood of the sentence 'Some C is an A'. Therefore no C is an A.   115.5

[2.4.19] One person said: 115.5

> There is no need to prove this by conversion or absurdity, since it is self-evident. It is clear that when B is [truthfully] denied of one thing and affirmed of another thing, then the two things are disjoint, since A is disjoint from B and C is not disjoint from B.

The person who took this to be self-evident is failing to distinguish between what is self-evident and what is nearly self-evident. The person who stated this argument failed to distinguish between the argument and the claim itself. It's true that two things being disjoint is equivalent to one of them 115.10

115.1 NB by notes above, this has to say that every C is a non-A all the time it's a C. Note that by using A and C, Ibn Sīnā has implicitly switched to the straight first-figure Ferio; in his proof of the second-figure Cesare it was C and B, not C and A.

115.5 Here he returns to the reductio argument. Since this is his first proof of a syllogism by reductio, he explains the rationale. But he garbles it; the fact that a proposition is posited as true doesn't make it in fact true. The 'reason for the absurdity' is that incompatible things have been assumed. So we can assume one of them and use the absurdity to discharge the assumption of the other and infer the falsehood of the other. This doesn't show that the other is in fact false. But Ibn Sīnā has no language for talking about discharge of assumptions.

115.7 It's tempting to delete from *'iḏā* to *lahu*, since the comment was made by somebody who didn't understand the argument. But Ibn Sīnā is quoting, and for all we know, the error was made by a translator into Arabic and not the person being quoted.

being [truthfully] denied of the other, as you know. But the mind necessarily pays attention to the fact that what [the premise-pair] says is

(8.21) When C is B which is disjoint from A (or which doesn't fit the description A).

So its reduction to something evident can be the actual implication. This person has already been contradicted by a person who understands 'disjoint' to mean genuinely contradictory. There is a long discussion of this in the section of Appendices.

[2.4.20] This [premise-pair] is also productive if one takes the universally quantified goal in the way that some people think, that the sentence 'Every C is a B, with absoluteness' means that all the existing Cs at some time are Bs, given that the time is the same in both the negative and the affirmative premises. The best response to this is to ignore it.

115.15

115.17

[2.4.21] The second mood: From two universally quantified premises, where the minor premise is negative, there follows a universally quantified negative conclusion. For example:

(8.22) No C is a B;
and every A is a B;
so no C is an A.

Thus when we convert /116/ the minor premise and we add it to the affirmative premise, they entail 'No A is a C', and then the conclusion is converted as required. [It can also be proved] by absurdity: if some C is an A and every A is a B, then some C is a B.

115.17 CAMESTRES

116.1 By Celarent.

116.2 Major plus negation of conclusion gives negation of minor by Darii.

[2.4.22] The third mood: From an existentially quantified affirmative 116.3 minor premise and a negative universally quantified major premise. For example:

(8.23)
> Some C is a B;
> and no A is a B;
> so not every C is an A.

It is proved by conversion of the negative premise. And by absurdity, if 116.5 every C is an A and no A is a B, then no C is a B, whereas we had that some C is a B.

[2.4.23] The fourth mood: From a negative existentially quantified mi- 116.7 nor premise and an affirmative universally quantified major premise. For example:

(8.24)
> Not every C is a B;
> and every A is a B;
> so not every C is an A.

The existentially quantified premise doesn't convert. The affirmative premise converts to an existentially quantified proposition, so it doesn't combine with the other existentially quantified proposition to yield a productive premise-pair. So let us prove it by absurdity: if every C is an A and every A is a B, then every C is a B — but we had that not every C is a B. Or 116.10 [for ecthesis] let some of C which is not a B be chosen; identifying it, let it be D. Then no D is a B, and every A is a B, so no D is an A. But some C is a D. So it is reduced to the first figure.

116.4 FESTINO, conversion reduces to Darii.

116.5 Reduced to Celarent.

116.7 BAROCO

116.10 For absurdity, reduced to Barbara. Then for ecthesis, reduced to Camestres. Instead of saying 'for ecthesis' (*farḍ*) he says *li-yufraḍ*); this is impossible in English since we have no verb 'to ecthesise'.

116.11 *li-tuᶜayyin* is a rare *li-* with 2nd person jussive, probably influenced by the mathematical style (*li-yufraḍ* etc.), cf. 117.14 below.

116.12 This second reduction is to Ferio.

116.13   The third figure:

116.14
116.15   [2.4.24] You know the distinctive feature of this figure in terms of its construction. The special feature of its productivity is that it entails only existentially quantified propositions, and its productivity condition is that the minor premise is affirmative and one of the premises is universally quantified. If both premises are negative, the two things denied of one thing don't have to be either compatible /117/ or distinct. If both premises are existentially quantified, it's possible that the one thing is affirmed in some thing, and that it is affirmed in some and denied of some; and it's possible that two disjoint things are both [truthfully] affirmed of some [B], or one is [truthfully] affirmed of some [B] and the other is [truthfully] denied of some [B]. If the minor premise is negative and [B] is [truthfully] denied of [A] and [B] is true of [C], it doesn't have to be either that [C] is true

117.5   of [A] or that it is false of [A]. You should look for terms [to prove these statements].

116.14 To prove the productivity condition we only need to show that the minor premise is not negative.

117.1 To rule out an I conclusion we want that they are disjoint, i.e. not compatible. To rule out an O conclusion we want that they are equal, i.e. not distinct.

117.2 So A and C can be equal, since we can have the same thing true of some B and of some B, and also true of some B and false of some B. We don't need both false since the case of two negatives has already been excluded.

117.3 It should be not different but disjoint. The simplest correction, though no evidence for it in the mss, is to replace *muḵtalifāni* at the end of line 2 by *muḵālifāni*.

36

[2.4.25] The first mood: from two universally quantified affirmatives 117.6
there follows an existentially quantified affirmative, as in

(8.25) Every B is a C;
        and every B is an A.

It doesn't follow from this that every C is an A. In fact it can be that C is
broader than B and a thing which is true of every B is either false of [some]
C or entirely outside C. But it does have to be the case that some C is an
A — let this some be B. This is an ecthesis. Or let us convert the minor
premise, so that [the premise-pair] becomes 'Some C is a B' and 'Every B 117.10
is an A'. Or let us say: If no C is an A and every B is a C, then no B is an
A, whereas we had that every B is an A, which is an absurdity of the kind
we mentioned.

117.6 DARAPTI

117.108 The 'or' case is clearly impossible here, so why does he mention
        it?

117.109 NB Here Ibn Sīnā takes ecthesis to be the inference $\phi(a)$ so $\exists x \phi(x)$,
        not the $\exists$-elimination. Not really; he could be referring to the whole
        argument.

117.110 Uses conversion and Darii.

117.111 For absurdity, reduces to Celarent.

117.13   [2.4.26] The second mood: From two universally quantified premises, of which the major premise is negative, there follows an existentially quantified negative conclusion. For example:

(8.26)   Every B is a C;
and no B is an A.

117.15   It doesn't follow from this that no C is an A, because C can include both the other terms. But it does follow that not every C is an A. For this, identify as B the 'some' [C which is not an A], /118/ Or let us convert the minor premise. Or let us say 'Otherwise every C is an A, but no B is an A, so no B is a C. But we had that every B is a C, and this is absurd.

118.3   [2.4.27] The third mood: From an existentially quantified affirmative minor premise and a universally quantified affirmative major premise:

(8.27)   Some B is a C;
and every B is an A;
it follows that some C is an A.

118.5   It is proved in the way you learned for the first mood.

117.13 FELAPTON

117.15 NB Curious counterexample to an example of Partee and others.

118.1 Converting the minor premise would reduce to first figure Ferio.

118.2 Reduced to Camestres, so we have third figure reduced to second.

118.3 DATISI

[2.4.28] The fourth mood: From a universally quantified affirmative mi-   118.6
nor premise and an existentially quantified affirmative major premise. For
example:

(8.28)
Every B is a C;
and some B is an A;
so some C is an A.

It is proved by ecthesis, by identifying the some B which is an A, and letting
it be D. So every D is an A; and every D be a B and every B be a C, so every
D is a C, while every D was an A, so some C is an A. Also it can be proved
by converting the major premise and then converting the conclusion so that
we have: Some A is a B and every B is a C, so it follows that some A is a   118.10
C, which converts to: Some C is an A. It can also be proved by absurdity,
namely if no C is an A and every B is a C, then no B is an A, while some B
was an A. This is absurd.

118.6 DISAMIS

118.8 *yakun* should surely be *wa-yakūnu*, though there is no ms evidence
for this.

118.9 The ecthesis reduces to Darapti!

118.10 Conversion reduces to Darii.

118.11 Absurdity reduces to Celarent.

118.13

[2.4.29] And the fifth mood is from a universally quantified affirmative minor premise and an existentially quantified negative major premise. An example is:

(8.29)
Every B is a C;
and not every B is an A;
so not every B is an A.

This is not proved by conversion, because the major premise /119/ doesn't convert and the minor premise converts to an existentially quantified proposition. It can be proved by ecthesis, by stipulating that the idea [B AND NOT A] is D; then as you know, we have that every D is a C, and no D is an A. And [it can be proved] by absurdity; namely if every C is an A and not every B is an A, then not every B is a C. This is absurd.

119.4

[2.4.30] The sixth mood: From an existentially quantified affirmative minor premise and a universally quantified negative major premise. For example:

(8.30)
Some B is a C;
and no B is an A;
so not every C is an A.

119.5

It can be proved by conversion of the minor premise, namely one says: Some C is a B and no B is an A, so some C is not an A by the first figure. And by absurdity, namely one says: Otherwise every C is an A, and we had that no B is an A, so no B is a C; whereas we had that some B is a C, and this is absurd.

118.13 BOCARDO

119.2 This reduces to Felapton.

119.3 Reduces to Baroco.

119.5 FERISON

119.6 In fact by Ferio.

119.8 Reduction to Camestres in second figure.

[2.4.31] Know that although the other two figures are reduced to the first 119.9
figure, those two figures do have their own special use, namely that with 119.10
some negative propositions, the way that they naturally come first into the
mind is with a particular one of the two ideas in them as the predicate and
the other as the subject. But if the proposition is converted, the result is not
what naturally comes first into the mind. An example of this is the sentence

(8.31)   The sky is neither light nor heavy.

which is a denial in the form that naturally comes first into the mind. The
same holds of the sentences

(8.32)   The soul is not mortal.

(8.33)   Naked fire is not visible.

And the conversions of these are for example: 119.15

(8.34)   Nothing light or heavy is the sky.

or

(8.35)   Nothing mortal is a soul.

/120/ or

(8.36)   Nothing visible is fire.

Even if these [converted] forms are true, they are not the natural forms in
which the proposition first comes into the mind. Fire comes first because it
is the subject of which one denies visibility, rather than visibility being the
subject of which one denies fire. Likewise in the other examples. In fact
the situation is the same with existentially quantified propositions. Thus
when we posit 'animal' and 'human' and an existential quantifier, the best 120.5
arrangement in this case is that 'animal' is the subject in the proposition

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119.13 As opposed to 'Nothing light or heavy is the sky.' See below.

41

and 'human' is the predicate, not the other way round, even though it is true that

(8.37)   Some people are animals.

120.6   [2.4.32] Then it is possible in many places that a premise-pair consisting of one negative proposition and one affirmative, and the result of taking care to put the negative proposition into the natural and preferable form is just that the premise-pair takes shape as a syllogism in the second figure. So the premise-pair consisting of these two propositions will be more nat-
120.10   ural if it is put in the second figure. And likewise a premise-pair consisting of an existentially quantified proposition in its natural form and a universally quantified proposition may just turn out to have the form of a third figure syllogism. Then when we convert so that the premise-pair reduces to the first figure, the negative proposition comes to have a form which is not what naturally comes first comes to mind, and an existentially quantified proposition in its natural form becomes unnatural. So we do need the second and third figures.

120.13   [2.4.33] The person who thought that absolute propositions are not used in practice was mistaken. In fact absolute propositions of every sort are
120.15   used in most of the sciences, and particularly in the science which is the art of the man who voiced this opinion. This is because philosophers investigate any universally quantified goal. When a philosopher wants to investigate /121/ a goal which is universally quantified and absolute, for example

(8.38)   Is abstinence good?

and

(8.39)   Is every body mobile?

it may not be possible to deduce these from necessary truths.

120.15 From next line, this logician was a philosopher. Al-Fārābī?

121.2 *ḍarūrī* presumably necessary propositions rather than necessity propositions.

[2.4.34] So now the facts about these three figures are known.

[2.4.35] And that being the case, you should know that premise-pairs consisting of necessity premises behave in the same way, and the same goes for conclusions [that are necessity propositions]. But they differ in the places where their proofs require one to use absurdity. This is because the   121.5 contradictory negations of their conclusions will not be necessity propositions. The reason for this is that if the conclusion is that with necessity not every C is an A — which can happen either in the second figure or in the third figure — then when we say 'If this is not true, then its contradictory negation is true', then we have just two options. The first is to take the contradictory negation, which is

(8.40)   It is not the case that with necessity not every C is an A.

But then you will find that this premise is not of a kind that can have added to it one of the premises of the [original] syllogism [so as to make a premise-pair]. The second option is to take a consequence of this proposition, namely that

(8.41)   Possibly every C is an A.

This consequence affirms a modality, namely broad possibility. But you   121.10 haven't yet learned how to compose syllogisms that consist of a possibility premise in the sense of broader possibility, together with a necessity premise. So therefore there is no way to prove the syllogism by absurdity before one has learned about syllogisms whose premises are a mixture of possible and necessary.

[2.4.36] So one has to prove it by ecthesis. Consider the fourth mood of   121.12 the second figure. In this case we have

      With necessity not every C is a B;
(8.42)   and with necessity every A is an B.
      This entails that with necessity not every C is an A'.

121.13 BAROCO. In line 121.14 correct *kullu b a* to *kullu a b*, as in several mss.

121.15 So let the 'some' which is necessarily a C and not a B be identified and called D. Since it was the case that with necessity no D is a B, and with necessity every A is a B, with necessity no D — and D is some C — is an A, and so some C is not an A.

[2.4.35]

121.14 At face value, Ibn Sīnā is using an inference from 'Necessarily not every C is a B' to 'Some C is necessarily not a B'. This is the Barcan implication. But that makes no sense here with modalities on the predicates rather than the quantifiers.

121.16 The data in this line certainly yield that some C is not an A, as Ibn Sīnā claims here. But in 21.14 he claimed that this conclusion holds with necessity, and that has not been established.

/122/ And the fifth mood of the third figure goes:

Every B is a C with necessity;
(8.43)   and with necessity not every B is an A;
     this entails that with necessity, not every C is an A.

Let D be [A B WHICH IS WITH NECESSITY NOT AN A]. Then the 'some [C]' is D, and with necessity no D is an A.

121.14 NB Incomprehensible argument with Ibn Sīnā's text. But as always he means 'There is C that with necessity is not a B'. So his argument confirms the reading of the sentence.

122.1 BOCARDO LLL, cf. Najat 48.11 for more details.

122.3 It seems to me the sense requires the second *c* to be *d*, though no ms support for this is given.

8.2   *Qiyās* ix.3

ix.3 On syllogisms composed of more than two premises, and a
        proof that there are many compound syllogisms

[9.3.1] /433/ It will have become clear to you that there is no recom- 433.5
binant syllogism with a single premise, nor is there one with more than
two premises. But you still have the option of raising a doubt and saying:
We have sometimes seen syllogistic discourse in which a proof is devised
which has a single goal but more than two premises. There are demonstra-
tions of this kind in the geometrical text *Elements*, and elsewhere.

[9.3.2] So we say: Syllogisms have many — i.e. more than two — premises 433.9
in any one of three cases. (1) Either these premises are not premises of the 433.10
proximate syllogism, but rather they are premises from which the premises
of a more proximate syllogism follow. Or (2) they are introduced by way of
induction or illustration. Thus they are not premises of the syllogism itself,
but premises of an induction to explain the legitimacy of a premise. Or (3)
they are not strictly necessary, though their usefulness is not far from ne-
cessity. This [usefulness] can take several forms. One is that [the premise]
is introduced as a stratagem; another is that it is introduced for decoration,
and another is that it is introduced to clarify the proof. It is introduced as 433.15
a stratagem when the intention is to draw a veil over the entailment, in
a case where if the necessary premises were introduced /434/ neat, then 434.1
one would guess what conclusion [the argument] was headed for, and one
would see how it was going to get there. [The argument involves] some-
thing that is difficult to accept; so one hides the drift so that it seems that
[the argument] is going nowhere, particularly when it does contain a use-
less element — and [thus] you bypass what made it difficult to accept. This
[is useful] in debate and in examination, and something like this can occur

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433.4 *Prior An* i.25, 41b36.

433.8 NB Ibn Sīnā says here that Euclid's Elements is 'syllogistic discourse'.

434.5 in feigned ignorance and in dressing-up and in using details to distract attention. When the purpose is decoration, premises are devised which make the discourse sound attractive, for flattery or for extricating oneself — these are premises [about something] whose presence or absence one desires as a matter of social status. When the purpose is explanation, there are for example similes that are not part of the argument but are introduced just to fix ideas. There are also quotations that are not part of the argument, and division of the expression, and translation of one expression into another, and other things discussed in the book *Jadal*.

434.9
434.10
434.11
[9.3.3] The proximate syllogism can't have more than two premises. [[But rather its minor term must be either potentially or actually included in the content of the major, both.]] So if there are more premises, and not because of induction or anything else like that, it is because the syllogism is compound. And the meaning of 'the syllogism is compound' is that the [proximate] syllogism is composed of two premises, one or both of which needs a syllogism to prove it. So two syllogisms are packed together, one of them yielding the [proximate] premise and the other the goal. In any

435.1 case the goal has an even number of premises [to prove it], /435/ and the premises entailing one of these two premises are an even number. There are an even number of premises to entail the two conclusions, since it is twice the number that entailed a single [conclusion], and even plus even is even. Therefore both simple and compound syllogisms have an even number of premises. So if the number of them is odd then either there is a shortfall or there is an excess. Or else the syllogism is invalid — if it can't be completed by adding a premise, and an equivalent syllogism can't be made by leaving out [a premise].

435.4
435.5
[9.3.4] There are two kinds of syllogism with a shortfall of premises. In one kind the major premise has dropped out because its general acceptance made it unnecessary to state it explicitly; or else [the missing premise] gives an impression that it didn't need to be stated explicitly, though if it had been made explicit its falsehood would have been clear — as happens in sophistry and rhetoric. Or the minor premise has dropped out for one of

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434.5 Dressing-up: *talbīs*: Jurjānī *Taᶜrīfāt* defines this as 'veiling of the explicit truth of the matter by means of the contradictory of what the argument is aiming at'.

these same reasons. In the other kind the premise drops out because it is not needed, but not because it is or appears to be obvious in itself, but because it is entailed by an array consisting of two premises that make it so clear that there is no need to state it after them as a premise. So the conclusion drawn 435.10 from those two premises drops out, and those two premises together with the other [proximate] premise form three premises from which the goal follows. When both of the [proximate] premises are the conclusions of syllogisms, then then one wouldn't expect to find both these premises dropping out as conclusions that don't need to be stated explicitly. If one of them drops out, then [it would be] the one whose syllogistic proof comes later. It's as if the [proximate premise] whose syllogistic proof comes earlier is finished when work begins on the one whose syllogistic proof comes later. So the [proximate premise] that is more appropriate not to be mentioned is the one which is the conclusion of the [preliminary] syllogism that is closer in time [to the conclusion].

[9.3.5] When there is an extra premise, this will be one of the cases which 435.14 were described to you earlier. If it was because the argument is not valid, 435.15 then the odd number of premises can't be restored to an even number in any way, either by taking away or by adding.

[9.3.6] /436/ Every compound syllogism is either connected or sepa- 436.1 rated. A connected [compound syllogism] is one in which the conclusions that come before the goal and are premises for the goal are explicitly mentioned. Equivalently, it is [called] a compound [syllogism] because one of the two premises [for the goal] needs a syllogism [to prove it], and [the two syllogisms] make a single compound [syllogism]; or because each of the premises [for the goal] needs [a syllogism to prove it], so that a compound 436.5 is formed by adding something.

[9.3.7] I have already talked about conclusions as conclusions, and then 436.5 I have talked about [conclusions] as premises. The way it goes is that one begins from the premises that are furthest from the goal. [The premises] are associated in pairs so they entail a conclusion which is also a premise. Thus if another premise needed to be proved, then [we would attach two premises to prove it]. If no [other premise] needed [to be proved], then we would take the premise [which was proved] and the other [proximate] premise and deduce [the goal] from them; so there would be four premises and two conclusions.

436.9
436.10
      [9.3.8] In the case where the other [proximate premise] has to be derived [as well], a syllogism with two premises is introduced in order to derive it. Then at one level there are four premises and two conclusions, and at the second level there are two premises and a single conclusion. So the compound [syllogism] contains six premises altogether and three conclusions altogether. The number of conclusions is half the number of premises. Each of the [simple] syllogisms contains three terms and a conclusion. Suppose in fact that each [proximate] premise [is proved by] a syllogism, and the
436.15
two [proximate] premises share a term. Then there are six terms, except that the one of them is shared in the middle, so there are five terms. The shared term and the term at one end of the five give rise to one proximate premise, and the shared term and the other end term give rise to the other [proximate] premise. The two end terms of the five give rise to the goal which is the target of the compound syllogism.

      [9.3.9] /437/ If just one premise [of the proximate syllogism] is deduced
437.1
from a syllogism, then in that case [the compound syllogism] consist of just two [simple] there are four premises: two premise for the premise [of the proximate syllogism] and two for [its] conclusion. One of the two [premises of the proximate syllogism] is the conclusion of the first syllogism; the other is not its conclusion. The goal is entailed by these two [premises]. So given that more than one [of the propositions] count as conclusions, the number of premises is four and the number of conclusions is two, since the number
437.5
of premises is twice the number of conclusions. Turning to the number of terms, in this case it is the same as the number of premises. An example: Every C is a B, and every B is a D, so every C is a D, and every D is an H, so every C is an H. Thus the terms are C, B, D and H.

436.11 NB For Ibn Sīnā the levels are the simple syllogisms, not the sentences. He doesn't see the compound syllogism as an array of sentences. Local formalising.

436.17 NB *tuḥassal min* for 'is formed from'.

437.2 Read ᶜ*alā l-muqaddamati* for ᶜ*alā l-muqaddami*, as required by the sense.

[9.3.10] The starting point for this is that when the syllogism is a single 437.8
[simple syllogism], the premises are formed from three terms. Next, if the
syllogism is two [simple syllogisms] and the second is at the same level as
the first — i.e. no part of the second syllogism is a conclusion from the first
syllogism, but rather [the two simple syllogisms] entail two completely dif- 437.10
ferent conclusions — [then] there are four premises, and there are not four
but six terms. But if the two syllogisms entail the two premises of another
syllogism, and thus share a term, then [the number of terms will be] five.
Next, if there are three [simple] syllogisms on a single level and their con-
clusions are completely different, then there are six premises (reading سِتًّا
) and nine terms. But if each pair of adjacent conclusions has a term in
common, then there are seven terms. Thus in each case the number of
terms in adjacent simple syllogisms is the number of premises plus one; 437.15
there are an even number of premises and an odd number of terms. Twice
the number of conclusions is the number of premises. [This number of
conclusions] can be either even or odd, because half an even number may
be even and it may be odd.

[9.3.11] /438/ Next we consider the case where two syllogisms are con- 438.1
nected in a different way, namely where one of the two syllogisms is at an
earlier level than the second syllogism, so that the first yields one of the
premises of the second. Then the first syllogism as a whole has three terms.
The second syllogism introduces another premise and another term. When
the two syllogisms are set out [separately] they have six terms. But two
of these six, which are terms of the first syllogism, [should be subtracted] 438.5
leaving four terms for the two syllogisms [together]. Thus the number of
terms is equal to the number of premises, and the [number of] conclusions
is half as many. Then if a third syllogism is introduced, which yields a
premise associated with the conclusion of the second [syllogism], this adds
a term. So the premises, including the conclusions at the first level, make
six; there are three conclusions and five terms. So when there were four
premises there were four terms; but now when another term is added,
there are six premises, and one conclusion [and one premise] in addition 438.10
to what was there before. Then if we add a term, this adds a syllogism, so

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437.9 NB He allows a *qiyās* that consists of two unrelated simple syllo-
    gisms. !

49

that there are eight premises, four conclusions and six terms. So the first [compound] syllogism has one more term than premise. The second syllogism has equal numbers of premises and terms (as if the premises were attached to the terms). In all the subsequent [compound syllogisms] there are more premises than terms, since with every [added] term two premises are added. In fact there are three terms at the outset. Then one term is added making four terms, and two premises are added to the two premises, making four. Then when [another] term is added, the result is that there are six premises and five terms. And so on and so on. So [from the third stage onwards] there are always more premises than terms. At the outset there are an odd number of terms, /439/ viz. three, in the second compound [syllogism] the number of terms is even, and in the third it is odd. And so on to infinity.

438.15

439.1

[9.3.12] And if the compound is mixed, it doesn't preserve the first ordering or the second ordering. As for the first ordering, because even if there continue to be an even number of premises, the terms won't stay an odd number and they won't have an arrangement/ As for the second ordering, there are always an even number of premises but the increase in the number of terms doesn't stay in line with the increase in the number [of premises] as more and more are added.

439.2

439.5

[9.3.13] The only case where all the compound syllogisms of this type (we exclude here the further construction that we will mention below) consist of syllogisms from just one figure is where the goal is universally quantified and affirmative. In fact the [proximate] syllogisms to [a goal of this form], and the syllogisms to the [proximate] premises, will be in the first mood of the first figure. I am referring here to predicative [syllogisms].

439.6

[9.3.14] If the goal is negative and universally quantified, one of its two [proximate] premises is universally quantified affirmative, and a syllogism proving this will be in the first figure. A syllogism proving its second premise can be in the first figure or the second, [[with exactly the same terms]]. Suppose for example that the goal is 'No C is an A', proved by

439.9
439.10

the simplest compound syllogism, namely where [each of the proximate] premises is derived by a syllogism. There are several cases.

[9.3.15] (1) The first case is that the minor premise is affirmative and the 439.13 major premise

439.13 For *'ammā 'in* read *'immā 'an*.

is negative. I am referring to the proximate syllogism, which is in the first figure. You will find that the minor premise can be proved only in the 439.15 first figure. But the major can be proved in either of two figures — in fact it can be proved in two ways in the second figure. One way is where the major premise is /440/ proved in the first figure: Every C is a B and Every 440.1 B is D, so every C is a D. Every D is an H and No H is an A, so no D is an A. So No C is an A. In the second way the major [premise is proved with] a second figure [syllogism] whose minor premise is affirmative: Every C is a B and Every B is a D, so Every C is a D. Every D is an H, and No A is an H, so no D is an A. So No A is a C. In the third way the major [premise is proved with] a second figure [syllogism] whose minor premise is negative: Every C is a B, and Every B is a D, so Every C is a D. No D is an H, and 440.5 Every A is an H, so No D is an A. So No C is an A.

[9.3.16] (2) The next case is that the minor premise of the proximate 440.7 syllogism is affirmative and its major premise is negative, where the [proximate] syllogism in the second figure. Then the minor can be proved only in the first figure also, while the major can be proved in either [of the first two] figures. In the first way the syllogism [proving] the major [premise] is in first figure: Every C is a B and Every B is a D, so Every C is a D. Every 440.10 A is an H, and No D is an H, so No A is a D. So No C is an A. In the second way the syllogism [proving] the major [premise] is in the second figure and has an affirmative minor premise: Every C is a B and Every B is a D, so

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439.12 Follow the reading *ᶜalā muqaddamatayhi* with one manuscript.

439.16 *aḥaduhumā* is certainly wrong, because this is the first of three cases. The critical apparatus reports that four manuscripts have a different text, but I can't make out what it is. Could it be *al-awwal yujarru* 'the first is carried out'? This would work.

441.1

Every C is a D. Every A is an H, and No D is an H, so No A is a D. So No C is an A. In the third way /441/ the syllogism [proving] the major [premise is in] second figure and it has a negative minor premise: Every C is a B, and Every B is a D, so Every C is a D. No A is an H, and Every D is an H, so No A is a D. So No C is an A.

441.4

441.5

[9.3.17] (3) The last case is where the minor premise is negative. [In this case [the syllogism] can be completed only in the second figure.] There are three ways to do this case, and they are the converses of the aforementioned three ways. You can inform yourself of this.

441.6

441.10

441.15

[9.3.18] If the goal is existentially quantified affirmative, then its proximate syllogism has two affirmative premises [[and just one of the two is universally quantified]]. If its form was in the first figure, then the syllogism proving the universally quantified affirmative major [premise] is in the first figure, and the syllogism proving the minor is either in the first figure [[and the minor has to be particular affirmative]] or else it is in the third (figure). in which case it is either from two universally quantified [premises] [[and the two remote syllogisms have to be in the first figure]]; or else from an existentially quantified [premise] and a universally quantified [premise], where the existentially quantified [premise] can be either the minor premise or the major. If the proximate syllogism is in the third figure and the minor premise is affirmative existentially quantified, then the syllogism proving the major premise is in the first figure, and the one proving the minor premise is, as you know, either in the first [figure] or else in the third [[in one of two ways]]. And if the minor [proximate] premise is universally quantified, the syllogism proving its minor premise is in the first figure, and the one proving its major premise can be either in the first figure or in one of at least three moods of the third.

441.4 For *'ammā 'in* read *'immā 'an*.

441.9 *Darii*

441.10 *Darapti*

441.11 *Disamis*, *Datisi*

[9.3.19] If the goal is existentially quantified negative [as in "Some C 441.16
is not an A"], then the proximate syllogism proving it can be in either the
first figure or the second or the third. If the proximate syllogism proving
it is in the first figure, then the syllogism proving the major premise of
this syllogism can only be in the first figure; and the one proving /442/
its minor premise can be in one mood of the first figure or in one of three   442.1
moods of the third figure. If the syllogism proving it is in second figure
and its minor premise is affirmative and its major premise is universally
quantified, then the [[proximate]] syllogism proving its major premise can
be in the first figure or one of two moods of the second figure, and the
one proving its minor premise can be in the first [figure] or in one of three
moods of the third figure. And the pairings in it are compounded, so it
is eight (?? so far?). And if [the syllogism proving it has] negative minor   442.5
premise, its major [premise] can be proved in one mood of the first figure,
and its minor can be proved either in one mood of the first figure or in
either of two moods of the second figure or in any of three moods of the
third. so there are twenty-four constructions.

442.1 I.e. 4 possibilities. But the major is of E form, so it has two proofs in
2nd figure too. ?!

442.3 The major premise is universally quantified negative, so its proof is
Celarent, *Cesare* or *Camestres*.

442.4 The minor premise is existentially quantified affirmative, so its proof
is *Darii*, *Darapti*, Disamis or Datisi. This gives another $3 \times 4 = 12$
cases.

442.6 So 6 cases.

442.7 ?? $4 + 12 + 6 = 22$.

442.8   [9.3.20] Next we consider the compound [syllogism] which separates
the consequences from the premises, in the sense that the premises are
explicit and the conclusions except for the final conclusion are completely
omitted. An example is

(8.44)   Every C is a D. Every D is an H. Every H is a Z. Every Z is an
             I. Therefore every C is an I.

442.10   In the first [such] syllogism [the conclusions] have to be explicit; this syl-
logism has two premises. [[The second [such] syllogism — in the example
we gave, the major premise [for the final inference] is explicit.]]   Then

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442.8 *Prior An* i25, 42b1.

442.9 This should surely be 'Every C is a D'.

442.9 For 'is an H' read 'is a D'. The H could be a faulty inference from
line 443.4 below, where Ibn Sīnā is saying not that 'Every C is a H'
is the first premise, but that it is the first *conclusion* as one fills in the
connected syllogism starting from the left.

442.11 This note seems to be a reference to the example of a *connected* com-
pound syllogism at 437.6f. This syllogism has three topmost premises
and four terms (so it is next in line after the three-term syllogisms
that Ibn Sīnā has just but first). There is one intermediate conclu-
sion, which contains the first and third terms. This conclusion com-
bines with the third premise to yield the main conclusion. So the
major premise for the proximate syllogism is the third of the topmost
premises, which is explicit in the corresponding separated syllogism,
as the note says. If Ibn Sīnā wanted to make this point at all, the ap-
propriate place would be in line 442.13 below where he turns to the
four-term syllogism. Probably the note is a reader's marginal jotting.

whenever we add a term, it adds a premise. So when we add a fourth term, it adds a third premise, and when we add a fifth term, we get a fourth premise. So the number of premises is one less than the number of terms. Thus if there was an even number of premises, there was an odd number of terms; and if there was an odd number of premises, there was an even 442.15 number of terms. And so on [as more terms are added].

[9.3.21] The addition of a term adds a possible conclusion potentially, 442.16 I mean a conclusion that is helpful for the goal. So whenever a term is added, this adds a conclusion, so the number of additional conclusions which /443/ are helpful for the goal is the same as the number of [added] terms. In some instances this number is even, [in some it is] odd. rWhen 443.1 we say 'consequence that is helpful for the goal', this means potentially. For example the compound (8) entails conclusions which are not helpful for the goal. The conclusions which are helpful for the goal this example of ours are for example 'Every C is an H', and 'Every C is a D'. A [conclusion] that is not useful for the goal is for example when we say (drawing syllogistic 443.5 conclusions from these premises): Every D is an H and every H is a Z, so

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442.14f The verb is in the perfect tense. This is normal for timeless state-
ments; but if it's a timeless statement about separated syllogisms of
all lengths, why does Ibn Sīnā add 'and so on' after it? Assuming
Ibn Sīnā is maintaining his normal standards of precision, the perfect
tense should probably be read as a statement about the cases already
considered; and then 'and so on' means that the pattern continues as
we add more terms.

This arrangement is interesting because the past-tense statement is
a formulation of an induction hypothesis. Since odd cases alternate
with even, the induction hypothesis can't be made plausible in the
usual way, by taking a single typical case. Ibn Sīnā's arrangement is
closer to the general pattern of a proof by induction on the natural
numbers than any other example I've seen in any author before the
19th century. But of course Ibn Sīnā has not stated the general princi-
ple of induction here. That came with De Morgan.

it follows that every D is a Z. This conclusion is not helpful for the goal in our chosen arrangement [of the connected syllogism]. If we had the option of choosing a different ordering and a different arrangement, we would make it that the premise 'C is H' is clear and the premise 'H Z' is not clear, so then we prove it. Then we add to it the premise '[Every] Z [is an] I' on the basis that it is clear. But then we would have altered the arrangement which we chose in this example. But [separated] syllogisms don't yield a [new conclusion] whenever a term is added.

[9.3.22] [Converting this example] to the other kind [of compound syllogism], the first [added] conclusion is 'Every C is an H'. Then we add 'Every H is a Z', and this entails 'Every C is a Z'. Then we add 'Every Z is an I', and this entails 'Every C is an I'. As for 'Every D is Z' and similar sentences, these play no role at all in this ordering of the syllogism.

[9.3.23] Know that the new term can be added just before the lesser term, or just after the greater term, or between the two.

[9.3.24] For a universally quantified affirmative [proposition], the only compound syllogisms that prove it are [entirely] in the first figure. [[The construction which occurs in this case is of the kind which you already know from the example which we gave.]] In the case of the universally quantified negative, we described what kind of connected compound syllogism /444/ proves it. [A separated syllogism equivalent to the first kind is: every C is a B, and every B is a D, and every D is an H, and no C (must be H) is an A, so no C is an A. One equivalent to the second kind is: Every C is a B, and every B is a D, and every D is an H, and no A is an H, so no

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443.15 *Prior An* i.26, 42b27.

443.17 In fact no example was given. Later in line, shouldn't it be *takūnu* ?

444.1 Better would be *al-wujūhi l-maḏkūrati*. The parallel is 440.1f.

444.2 This is an extended *Celarent*. The parallel is 440.3f.

444.3 This is an extended *Cesare*.

C is an A. And one equivalent to to the third kind is: every C is a B and every B is a D, and no D is an H, and every A is a D, so 'No [[a]] C is an 444.5 A. These are typical of the kinds [of syllogism] in which the [intermediate] 444.6 conclusions are not expressed at all, and ???, and [these conclusions] are merely potential, so that we mention explicitly only the final [conclusion].

[9.3.25] These things will make it clear to you that it is very difficult 444.7 to find a syllogism whose conclusion is a [given] universally quantified affirmative proposition, regardless of whether the syllogism is atomic or compound, since [such a syllogism] can exist only in a single mood of a single figure. It is very easy to find a syllogism proving the opposite [kind of proposition], because it can be proved in any of six different moods. 444.10 By 'opposite' here I mean the existentially quantified negative proposition, which can be proved through very many moods of compound syllogism; we counted them for you. In terms of difficulty the universally quantified negative proposition is like the universally quantified affirmative proposition. This can be confirmed along the lines of the discussion above. In terms of difficulty the universally quantified negative proposition comes close to comparison with the existentially quantified affirmative proposition. This also can be confirmed along the same lines.

[9.3.26] Know that in the separated compound [syllogism], when it con- 444.15 cludes with negative premises after the affirmative ones, then ideally it should join up, but in fact the ordering splits here. When [the compound syllogism] begins with /445/ negative premises and then some set or other 445.1 of affirmatives comes into play, then the syllogism conforms to the separated construction throughout. [A compound syllogism] can be constructed out of both duplicative and recombinant syllogisms. The entailment can include either recombinant syllogisms (both meet-like and difference-like) or duplicative syllogisms.

444.8 NB *wujūd* here is clearly 'finding', as also two lines below.

444.5 We need for extended *Camestres*: Every C is a B. No B is a D. Every A is D. So No C is an A. This is actually the general case — the two of form A can be replaced by chains of sentences of form A, with the order of the terms reversed in the second chain.

444.4 Corrected from the parallel passage at 440.5f. Delee *a* last but one word in line.

8.3   *Qiyās* ix.4

ix.4 On acquiring the premises and authenticating the syllogisms
that prove this or that goal

Prior Analytics i.27 43a20

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[9.4.1] /446/ We have devoted a lot of time to this definition [of syllogism], by way of explaining what a syllogism is, how many moods it has, and the difference between simple and compound syllogisms. But knowing how to tell a correct syllogism from an incorrect one is less than wholly useful for us if we don't know how to acquire and authenticate a syllogism [in the first place]. This is because if we need a syllogism to give us a particular piece of knowledge, it is not enough for us to know what a syllogism is. We are in the position of a person who knows what medicine is helpful for some ailment, but this is not enough for him to cure the ailment if he doesn't also know where to ask for it and get hold of a certified sample. If he happens to get hold of a validated and certified sample then he can use it, but if that doesn't happen, he will remain frustrated because it's no use to him to know the nature and properties of medicine when what he needs is the actual thing. So it's appropriate for us to spend some time indicating how one obtains a syllogism, and we will come at it from all angles.

446.12

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[9.4.2] Now acquisition of a syllogism that is demonstrative or dialectical or of some other kind is a special case of this present enquiry. To be precise, we are investigating syllogisms in general, not some kind of syllogism such as demonstrative syllogism or dialectical syllogism. so likewise our investigation about acquisition of the syllogism is just about the syllogism absolutely, not about some particular kind of syllogism.

447.1

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[9.4.3] /447/ Let us consider what the First Teacher told us about this, granting that his account of the whole of this art was potential as much as actual. In our own words, it goes as follows. We already know that ideas are either singular ideas or universal ideas. A singular idea can be either literally 'found in' an individual, or else 'predicated of' individuals. For example [THIS WHITE THING] is predicated of Zayd, not literally ['found in' him]. This has already been explained to you in another place. Next, some universal ideas are so close to singular ideas that there is no idea in between them, and some universal ideas are so far distant from individual ideas that there is nothing more general, while some ideas are intermediate between these two. Also every predicate is either essential and occurs naturally in

predicate position; or else it accidentally plays the role of predicate, for instance when a subject is predicated of its accidents. An example is where [HUMAN] is predicated of [WHITE]. Another case is where there are two accidents, both of which are predicated of the same subject by a natural predication, but then one accident is predicated of the other; an example is when [WHITE] is predicated of [MUSICIAN]. Not every accidental predication comes from taking a subject as predicate of its accidents. Another 447.10 case of it is where a subject is predicated of an essential idea that is constitutive of the subject and [hence] broader than it. For example [HUMAN] is predicated of [ANIMAL], and [ZAYD] of [HUMAN]. These predications appear as existentially quantified propositions. But [propositions] that are inherently necessary, because of of the natures of the ideas as opposed to the accidents that lie outside the ideas, are where a narrower idea stands as subject in relation to a broader one; this occurs when an idea is made a subject for its propria and its accidents rather than the other way round. If two or more predicates are naturally predicated of one and the same idea, this fact itself shows that the predicates have some of the same whatness; 447.15 this holds equally well if you understand 'predicated' as meaning 'true of' or as meaning 'generally accepted as being true of'. There are many cases where one idea is predicated of another by a predication which is not essential and truthful, but it is generally accepted as being predicated essentially. In some such cases an idea X is not broader than an idea Y, but X is generally accepted as being broader and higher than Y. Also there are ideas intermediate between the broadest and the narrowest; in fact most of the discussion and most of the enquiry is about these intermediate ideas.

[9.4.4] When you want to acquire a syllogism [that proves a given conclusion], take /448/ the two terms [of the goal, say C for the subject term 447.19 and A for the predicate term]. Then if X is one of these terms, look for its definition and its propria and all the ideas Y with $X \to Y$. [For these Y] I mean the definition [of each term] from genus and differentiae, the genus of the genus, the genera of the differentiae, the differentiae of the differentiae, the accidents and constitutives of these, the genera and differentiae of the accidents, the accidents of the accidents (these also are accidents of X), and in general the ideas Y such that $X \to Z$ and $Z \to Y$ for some Z. Likewise, for each of the terms X [of the goal], you will look for those ideas W such 448.5 that $W \to X$, again including W such that $W \to V$ and $V \to X$ for some V. These are the ideas you should look for if the goal is an affirmation. When the goal is a denial, then for each term [of the goal], look also for ideas that

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are either necessarily or actually false of that term. Don't bother to look for Y such that X is false of Y, because if Y is false of X then X is false of Y, and in fact if X is false of Y then Y is false of X too. But of course ideas that occur naturally as subjects are not the same thing as ideas that occur naturally as predicates, although the classes [are treated as] overlapping when a sentence is put the unnatural way round, as you already know.

448.10

448.11   [9.4.5] When you validate these things, in the course of the validation you should investigate whether [the relations between the ideas] are things that are really true or are [just] generally accepted. Know that the more you concentrate on seeking out these ideas that are true of a term, or have a term true of them, or are incompatible with a term, the closer you will get to achieving your aim. Ideas that are true of [some of] a term but not true of it universally are in most cases not helpful; but you will be able to make use of those that are true of all of the term. The same applies to ideas that
448.15   the term is true of, and to ideas that are incompatible with the term. Know that to get a validated syllogism you need things that are true universally. To say that Y is 'true of X universally' doesn't mean that all of Y is true of X, it means that Y is true of all of X; but this will already have become clear from earlier discussions.

448.17   [9.4.6] Just as you get no new information from investigating the ideas W such that the term /449/ is false of W — I mean false of all of W — it's also a waste of your time, if X is a term of the goal and $X \rightarrow Z$ and $Z \rightarrow Y$, to investigate whether $X \rightarrow Y$, since that always follows. The same applies when Y is a term of the goal. Also when you examine an idea Y, it will be a waste of your time to check whether $X \rightarrow Y$ and $X' \rightarrow Y$ for both of the terms X, X' of the goal, or whether $Y \rightarrow X$ and $Y \rightarrow X'$. Knowing that,
449.5   you can useful devote your attention to checking whether $X \rightarrow Y$ but not $X' \rightarrow Y$, and also to whether the relation holds with necessity in one case but not in the other. In our view it will be well worth your while to spend time on these questions, particularly if you were to memorise what we will tell you about them. Also it won't be informative for you to investigate ideas Z such that $C \rightarrow Z$ but not $Z \rightarrow A$; you won't get a syllogism out of that. But you should investigate, when an idea is true of a term, whether
449.10   it is necessarily true, or contingently true, or permanently true, or true in most cases.

449.10   [9.4.7] Now every goal is derived from premises that are similar to it. So when your goal is universally quantified affirmative, you look for an

idea Z such that $C \rightarrow Z$ and $Z \rightarrow A$. When you find it, you have your syllogism.

[9.4.8] If [the goal] is existentially quantified, then look among the ideas   449.12
Z such that $Z \rightarrow C$ and $Z \rightarrow A$. Then when you find a Z that works for both, you have a syllogism in the third figure, which yields [your goal as] a conclusion. If you don't find that but you do find, among the ideas Z such that $Z \rightarrow C$ and some or all A is a Z, or with C and A the other way round, that will give you what you want.   449.15

[9.4.9] If the goal is negative, then look for ideas Z such that $X \rightarrow Z$ 449.15
and $X'|Z$ where X, X' are C, A in some order. If you find such a Z then you have your syllogism in the second figure. If the goal is existentially quantified, you ask whether there is Z such that $Z \rightarrow X$ and $Z|X'$ where X, X' are C, A in some order. When you find one, you have your syllogism.

[9.4.10] When you have gained some proficiency /450/ in this, you will   449.18
have learned the usefulness of the middle term, and [you will have learned] that the middle term is what creates the syllogism.

[9.4.11] When you examine the things that are true or not true of A and   450.1
C, begin with the broadest of the ideas that are true of one of these terms, and ask whether it is not true of the other term. If you find that it is not true of it, ??? [you have what you need], and you know that any other idea true of the first term will fail to be true of the second. But if you don't find it like that, but rather you find that it is true of the second term, then go down one level; start from the broadest and go down from it step by step. This will   450.5
give you rapid success in finding your first syllogism. Thus if [RATIONAL] is false of [THE COLOUR WHITE], it is not primitively false of it, given that [BODY] and [SUBSTANCE] are also false of [THE COLOUR WHITE].

[9.4.12] When you are involved in this examination, then it is not enough   450.7
to formulate ??? ??? your question as whether among the ideas true of one of the two terms there is anything that is contrary to true of the other, or in contrast with it, so that you say for example

(8.45) C is cold;
            and A is hot.

or we say

(8.46) C is the sky;
            and A is the earth.

450.10   The reason is that there has to be just one middle term. In this case there are two middle terms, and that forces you to make what you could have arranged as a single syllogism into more than one syllogism. That is because in your case A is not denied of C just because some descriptive term is true of C which is contrary to a descriptive term true of A, which would give justification for forming a syllogism that entails a negative conclusion. If instead of the contrary of the idea one had something added to the idea, or a privation, or a disposition, or anything else that has the effect of altering

450.15   it, then it would give rise to a syllogism. But the primary justification for a syllogism is that there is something that is true of C and not true of A, or the other way round.

450.16   [9.4.13] If [COLD] is true of C, then it might have either of two relations to A, the first being that it is not true of A, and the other is that it is contrary to being true of A. /451/ All that is needed to form a syllogism is that [COLD] is not true of A. If you [don't] keep 'not true of' but replace it by: 'contrary to being true of', you still have a syllogism meeting your requirement. If it was possible that you kept 'contrary to' but imagined for example 'true of', so that you make its contrariety true of the same thing, then no syllogism would be formed from it. And this compels you to work

451.5   on two questions. When you find that [COLD] is true of C, and you consider whether [COLD] is or is not true of A, and then you find it among all the things that are not true of A, ??? [you have what you want].

451.6   [9.4.14] If you start again after achieving your aim, and you take up the question whether there is among the things that are true of A something contrary to C, then you are asking for something superfluous to your requirements, unless of course you are looking for a second syllogism. The

451.9   fact is that if you find both these ideas, then you have found not a single

451.10   syllogism but two syllogisms. When you use them it's as if you said:

(8.47) C is cold;
          and A is not cold.

and also

(8.48) C is not hot;
          and A is hot.

451.11   [9.4.15] Absurdity is another way of acquiring [syllogisms]. The method is that you take the contradictory negation [of the goal], and consider its

terms [C and A]. When you go in search of the ideas that are true of these terms and the ideas that these terms are true of, and so you find a true premise which is built using one of the extremes A and C, and which together with the contradictory negation entails something impossible, then you have tracked down a syllogism of absurdity. And of course this way of doing things is useful, given that every [syllogism by reduction to] absurdity — as will be explained to you — can be reduced to a direct syllogism in one way or another.   451.15

[9.4.16] You can use this approach in the same way to get what you   451.15 need in the form of a duplicative propositional syllogism, as you know. You can also use this method to acquire an inductive argument. You do this by examining those ideas that the subject term is true of. Then when you find among the things true of the subject term something that indicates that the subject term is equivalent to [the sum of] those ideas, that allows you to acquire a syllogism with universally quantified conclusion. Then from that you can acquire a syllogism with existentially quantified conclusion by applying conversion [to the conclusion]. In the affirmative case this equivalence allows you to affirm [the predicate] of the subject alone [as opposed to the particular cases]. If the goal is a denial, then you can deny [the   451.20 predicate] /452/ of the subject alone.

[9.4.17] Throughout all this you should pay attention to the question   452.1 whether the propositions are asserting a necessity or a possibility. In the case of an absoluteness proposition, if you determine that it is such a proposition from the fact that it carries a condition stating that the content is not permanent, you will have found that its matter is possible. If you take the proposition to be a broad absoluteness proposition, then you will have taken it [to assert either a necessity truth or a possibility truth], so you won't need to treat either case specially.

[9.4.18] Suppose someone said:

If [we've decided that] the proposition expresses a possibiity, how can we go on to make it a universally quantified absoluteness proposition? [For example] if we've determined that writing is a possibility for humans, we don't go on to say   452.5

(8.49)

Every human is a writer.

Our answer is: We have already advised you to take those ideas that are true of all the term, and those that have the term true of the whole of them. That comes first; when you want to consider possible and necessary, you should consider them after that. The ideas that are true of the whole term, when they are not permanent and not necessary, then they are possibly true of the term and absolutely true of it, as you know. So at that stage it will have been clear to you that these absolute propositions are true, even if the proposition (8.49) constructed from 'human' and 'writer' is not in the set [that you examined]. So when you do spend time on considering what is necessary and what is not necessary, and you find something possible together with the things that are true of the whole term, and your aim is to prove a goal with absoluteness rather than necessity, then you will have found what you needed. If your aim is to prove a goal that is absolute in the broad sense, which a more appropriate aim for you to have, then you will have found an absolute proposition either by finding a narrow-absolute one or by finding a necessary one. So in this case there is no possible [further] enquiry for you to make about whether the proposition is absolute.

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[9.4.19] Just as a denial or a predication can make either a true [statement] or one that is generally accepted, necessity and the lack of it can be either the truth or else something that is generally accepted. Things that are generally accepted are sometimes not only generally accepted but also true, but sometimes they are only generally accepted before one starts to think about them. When you acquire a syllogism with a conclusion that is absolute, you should make these distinctions.

452.18

[9.4.20] You should know that every art has its own premises. So when one looks to see what is /453/ true or not true of what, one must do this with reference to the study of the particular art. But some methods for recognising the premises
are common [to all the arts], which makes it easy for you. Many premises arise from experiment and many from induction; [later] you will learn the difference between these two.
{Induction is treated later in *Qiyās*, at ix.21 corresponding to Aristotle's *Prior Analytics* ii.23. But Ibn Sīnā's main detailed comparison between the two methods is in *Burhān* i.9. }

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453.6

[9.4.21] So this has given an indication of how we can acquire a syllogism. This question will be given a thorough examination when we talk about the art of debate. But someone might well say: If the broad account

above corresponds to the detailed exposition in *Jadal*, then this is not a general study of how we acquire syllogisms; it is only about how syllogisms arise in the study of debate. We answer: In the relevant part of the study 453.8 of debate, one studies how to acquire syllogisms whose premises are generally accepted [as true]. The things that are generally accepted include the axioms [of the arts]: every axiom is generally accepted, but not everything that is generally accepted is an axiom. So the discussion of debate includes 453.10 the discussion of demonstration, at least to the extent that demonstration can be usefully applied to what is generally accepted. But the book *Jadal* just investigates premises in the context of their being generally accepted, whereas the book *Burhān* seeks premises in the context of their being true. The present book investigates them in a context which includes both.

[9.4.22] The present study and that in *Jadal* have an overlap in what 453.14 they study, but they differ in that the present study is more general than 453.15 that in *Jadal* in the questions that it considers, though not in its subject. The difference is that in the present work we don't consider whether they are generally accepted; we just consider whether they are premises. The book *Burhān* asks whether they are primary and true. The book *Jadal* asks whether they are generally accepted. Even though the questions whether a proposition is primary /454/ or useful for demonstration are relevant to the study in *Jadal*, they are relevant accidentally rather than essentially. Being generally accepted is not part of the concept of a primary premise. But being a premise is a part of that concept, and that applies also to the kind of study made in the book *Burhān*. So the concept of a premise can enter essentially into the study in *Burhān* because the concept of a premise, taken without further condition, applies both to demonstrative and to dialectical premises. The concept of a premise is broader than the concept of a generally accepted premise, and it is broader than the concept of a premise that 454.5 is true but not generally accepted. It's legitimate to divide up the study of premises in general and restrict it to the study of premises in the context of their being demonstrative. The study of the general acceptance of premises is not a generalisation of the study of the demonstrativeness of premises. So the study of demonstrative premises is not a special case of the study of dialectical premises, but it can be regarded as a special case of the study 454.10 of premises in general. In fact demonstrative and dialectical syllogisms are both special cases of syllogism in general. Neither of the two is a special case of the other.

[9.4.23] But someone might well say: What did you have in mind when 454.13

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you avoided approaching this question from the point of view of rhetorical or sophistical or poetical syllogisms, so that you didn't assign it to the volumes on rhetoric or sophistry or poetry, but rather you assigned it to that on debate? We answer: Acquisition of syllogisms has its main use is in those arts that are universally applicable, and there are three arts that are intended for general application, namely demonstration, debate and sophistry. But the art of sophistry is unacceptable, and one learns it only in order to be sure of getting results when one produces its contrived syllogisms. What would be the educational purpose in acquiring sophistical syllogisms? The fact is that when you check what holds or doesn't hold of what, if instead of relying on truth or general acceptance you take what just looks as if it might hold or not hold of what, you could get into the position

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of having validated a sophistical syllogism.

8.4   *Qiyās* ix.6

ix.6 The analysis of syllogisms, with a mention of dos and don'ts
         that can be relied on and used in that [analysis].

[9.6.1] /460/ Sometimes a person is addressed with a well-crafted and
definitive syllogism, or he finds such a syllogism written in a book. But   460.5
then [sometimes] the syllogism is not simple but compound; or its con-
struction is not connected but separated. And sometimes moreover the
pieces are jumbled out of their natural order, or a part of the syllogism
is hidden, or something superfluous is added. [Even] when it is simple,
sometimes it is jumbled out of its natural order, or missing a piece, or with
a piece added. You already know how this happens. If we don't have rules
to guide us, on how to seek with due deliberation the syllogism that proves
a given goal, [and to confirm] the soundness of the connection between a   460.10
given syllogism [and its goal], so that we can analyse the syllogism into a
group of premises, put them in the natural order, strip off defects and add
any part that is missing, reducing the syllogism to the syllogistic figure that
produces it — [if we don't have rules for all this,] then the new information
that the syllogism provides will escape us. If the syllogism is sound then
[so is] what it entails. If it's faulty, one should locate the fault either in its
premises or in its construction.

[9.6.2] So we need to have rules in the form of dos and don'ts, to be   460.15
used in the analysis of a syllogism. The rules should apply, not on the
basis that the syllogism is demonstrative or dialectical or some other kind,
but on the basis that it is an absolute syllogism. Then when you are given
[the syllogism], you reach what the analysis leads you to, /461/ and it
agrees with your starting point when you followed the route of synthesis.   461.1
Thus you find the truth agreeing with itself, however you come to it, and
standing as witness to its essence. For the truth, insofar as it is what is the
case, stands witness to its essence insofar as [its essence] is how the truth
is conceptualised. Likewise insofar as [the essence of truth] is the starting
point of [the truth], [the truth] witnesses to its essence insofar as [the truth]
is where [the essence] leads us to; and insofar as [the essence of truth] is
where [the truth] leads us to, [the truth] stands as witness to its essence
insofar as [the truth] is the starting point of [its essence].

[9.6.3] So when you have found a syllogism, you start by looking for   461.4,5
its two premises. You do this before looking for the terms, because gath-

ering up fewer things is easier [than gathering up many]. Also when you start with the terms, it can be that there are more than two ways of combining them into two premises, so that the cases you would need to consider would ramify. The reason for that is that by locating the terms you don't thereby locate the premises as things composed [from the terms]. You would have to examine the case of each term, and then examine four possible ways of combining [pairs of terms]. So you would have to consider five

461.10   (topics of) discussion: first you would consider the terms [themselves], and then you would consider the four cases which arise from the ways of composing the premises from two terms. But if you locate the two premises, it's enough for you to consider one more thing, namely to list the terms. Thus when you have found two premises, locating the syllogism and how it behaves will be easy for you.

461.12   [9.6.4] Then the first step is to investigate whether each of the premises shares one of its terms with the goal but is distinguished from the goal by another [term]. Suppose [it does, and] one of the two premises shares both its terms with one part of the second premise, while another part of the second premise — not the whole of it — shares both the terms of the goal. Then the syllogism is duplicative, and the premise which has one part overlapping the goal and another part overlapping the other premise is a propositional compound, /462/ while the other premise is a duplication.

462.1   So look carefully at [the sentence] which has a part overlapping the goal in two terms: is it meet-like or difference-like? If it is meet-like then find out whether its overlap [with the goal] is its first or second clause, and find out whether that other [sentence] is the same [as this part of the premise], or is its contradictory. If the sentence is difference-like, then find out whether the overlapping parts are the same or contradictories. Do the same with the other [premise], which is the duplicating one. In this way your syllogism

462.5   is analysed into the propositional moods.

462.5   [9.6.5] If this is not the case, and for every [sentence] of the syllogism the goal (which is proved through [the syllogism]) overlaps it in just one term, then you know that the syllogism is recombinant. If you have found that each of the premises overlaps the conclusion, then look for the middle term, so that you find the figure. Then connect the terms to the conclusion, so as to find the major and minor [premises] and the other things that you should be looking for. If you can't find a middle term, then the syllogism

462.10   is not simple; instead you have a compound syllogism with at least four terms.

[Example 1.] Suppose the goal is universally quantified affirmative, namely 462.10
'Every C is an A', and suppose that the found premises are 'Every C is a B'
and 'Every D is an A'. Then if it's clear that 'Every B is a D', your syllogism
is in good order; otherwise it needs a middle.
[Example 2.] Suppose the goal is universally quantified negative, [namely
'No C is an A'], and suppose the found [premises] are 'Every C is a B'
and 'No D is an A'. Then consider whether 'Every B is a D'. If so, then a
syllogism can be composed. If not, then it needs a middle.
[Example 3.] Suppose the found premises are 'No C is a B' and 'Every A is a 462.15
D'. Then it will be no help to you in this case to find 'Every B is a D', so that
the negative [premise] becomes the minor [premise of a syllogism] in the
first [figure] and the remaining two premises are affirmative. So consider
whether it's true for you that 'Every D is a B'. If it is, then you say 'Every
D is a B' and 'No C is a B', /463/ which entails: 'No C is a D'. Then you
add to it that 'Every A is a D', so that it entails 'No C is an A'.
[Example 4.] Suppose the found [premises] are 'No C is a B' and 'Every D
is an A'. Then it can't be used.
[Example 5.] Suppose the goal is 'Some C is an A', and you have found [the
premises] 'Some C is a D' and 'Every B is an A'. Then if 'Every D is a B' is
attached, you have found [the syllogism].
[Example 6.] If the found [premises] are 'Every D is a C' and 'Every B is
an A', then if 'Every D is a B' is attached, you have found [the syllogism].
[Example 7.] If the *ḥāṣil* [premises] are 'Every C is a D' and 'Some B is an 463.5
A', then if 'Every D is a B' or 'Some D is a B' is attached, it can't be used.
If 'Every C is a B' or 'Some C is a B' is attached, it can't be used. Likewise
if 'Some B is a C', or 'Some B is a D' is attached, it can't be used. And
likewise if 'Every B is a D' is attached, it can't be used. And if 'Every B is
a C' is attached, it doesn't entail to ['Some] C is an A'.
[Example 8.] If the found *ḥāṣil* [premises] are 'Some D is a C' and 'Every
B is an A', and 'Every D is a B' is attached, then this makes the syllogism
ḥāṣil.
[Example 9.] If the *ḥāṣil* [premises] are 'Every D is a C' and 'Every B is an 463.10
A', and 'Every (or some) D is a B' is attached, then this makes the syllogism
ḥāṣil.
[Example 10.] If the *ḥāṣil* [premises] are 'Every D is a C' and 'Some B is an
A', it can't be used.
[Example 11.] If the *ḥāṣil* [premises] are 'Some D is a C' and 'Every A is a 463.12
B', it can't be used.

So consider the remaining cases [with existentially quantified affirmative goal] in the same way.

[Example 12.] Suppose that the goal is existentially quantified negative: 'Not every C is an A', and that you have found [the premises] 'Some C is a B' and 'No D is an A'. Then if [an appropriate sentence with terms] B, D is attached, then you can use it — for example 'Every B is a D'.

463.15   [Example 13.] If you have [the premises] 'No C is a B' and 'Some D is an A', it can't be used.

[Example 14.] Likewise if you have [the premises] 'Every C is a B' and 'Not /464/ some D is an A', [it can't be used].

[Example 15.] If you have [the premises] 'Not every C is a B' and 'Every D is an A', then it can't be used.

[Example 16.] If you have [the premises] 'Some B is a C' and 'No D is an A', and 'Every B is a D' is attached, you can use it.

[Example 17.] If [the premises] are 'No B is a C' and 'Some D is an A', it can't be used.

[Example 18.] If [the premises] are 'Every B is a C' and 'Every D is an A', it can't be used.

[Example 19.] If you have [the premises] 'Not every B is a C' and 'Every D is an A', it can't be used.

464.5   [Example 20.] If you have [the premises] 'Some D is a C' and 'No A is a B', and 'Every D is a B' is attached, then you can use it.

[Example 21.] If you have [the premises] 'No C is a B', and 'Some A is a D', it can't be used.

[Example 22.] If the *ḥāsil* [premises] are 'Every C is a B', and 'Not some A is a D', it can't be used.

[Example 23.] If the *ḥāsil* [premises] are 'Not every C is a B', and 'Every D is an A', it can't be used.

[Example 24.] If you have: 'Some C is a B' and 'No A is a D', and 'Every D is a B' is attached, you can use it.

464.10   [Example 25.] If you have [the premises] 'No B is a C' and 'Some A is a D', then it can't be used.

[Example 26.] If you have [the premises] 'Every B is a C' and 'Not every A is a D', it can't be used.

464.12   [9.6.7] Likewise in the other remaining cases. This is when the two premises each share a term with the goal. If the two [premises] share [a term] with each other, and they don't share with the goal at all, then don't bother to analyse it, because in this case the shortfall is too great. And like-

464.15   wise when only one of the two shares [a term] with the goal, and the other

doesn't share with the goal or with its companion, then [the argument] is not straightforward to analyse. In order to explain how to analyse it we would need to apply a lengthy principle /465/ that is not expressible in   465.1
a rule that one can take on board briefly. Analysis of [such an argument] is possible, but the appropriate place for this is the appendices, which will also [extend] analysis to more than two premises. [9.6.8] If you have found two premises that share [a term] with each other, and one of them shares [a term] with the goal, then this shared [term] is either the subject or the predicate of the goal.

Suppose it is the subject.   465.5

[Example 27.] First suppose the conclusion is universally quantified and affirmative, thus: 'Every C is an A.' Suppose the found [premises] are 'Every C is a B' and 'Every B is a D'. Then if you have found [a premise] linking D to A, this makes [the syllogism] *ḥāsil*.
[Example 28.] Suppose the conclusion is universally quantified negative [thus: 'No C is an A'], and the found [premises] are: 'Every C is a B' and 'Every B is a D'. Then if you have found [the premise] 'No D is an A', this makes [the syllogism] *ḥāsil*.
[Example 29.] If you have found [the premises] 'Every C is a B' and 'No B is a D', and then you found [the attachment] 'Every A is a D', this makes [the syllogism] *ḥāsil* without needing to be converted.   465.10
[Example 30.] If you have found [the premises] 'No C is a B' and 'Every B is a D', it can't be used.
[Example 31.] If you have found [the premises] 'No C is a B' and 'Every D is a B', and then you found the premise 'Every A is a D', this makes [the syllogism] *ḥāsil*.
[Example 32.] Suppose the conclusion is existentially quantified affirmative [thus: 'Some C is an A']. Suppose [the premises] 'Some C is a B' and 'Every B is a D' are already *ḥāsil*, and 'Every D is an A' is attached, then this makes [the syllogism] *ḥāsil*.
[Example 33.] Suppose [we have] 'Every D is a B' and 'Every B is a C'. Then if 'Every D is an A' or 'Some D is an A' is attached, this makes [the syllogism] *ḥāsil*.
[Example 34.] Suppose [the premises] are 'Every C is a B' and 'Some B is a D'; then this can't be used.
[Example 35.] If the existentially quantified [goal] is negative [thus: 'Some   465.15
C is not an A'], and you have found [the premises] 'Some C is a D' and 'Every D is a B', and 'No B is an A' is attached, this makes [the syllogism]

ḥāsil.
[Example 36.] If you have found [the premises] /466/ 'Some C is a B' and 'No B is a D', and 'Every A is a D' is attached, this makes [the syllogism] *ḥāsil.*

Work through the remaining cases of this kind for yourself , taking the compound [syllogisms] in turn.

466.3   [9.6.9] You should know that when we said: 'This makes [the syllogism] *ḥāsil*', this meant *ḥāsil* without having to alter [the syllogism] by forming the converse of the found [premise]. Also you should know that we are not putting ourselves to the trouble of telling you now what figure the *ḥāsil*
466.5   [syllogism] is [proved] in. If you don't understand that, and didn't memorise what was said [about it earlier], you won't have been able to make any use of this [lesson].

466.6   [9.6.10] [Example 37.] If the shared [term] is in the predicate of the goal, and the goal is universally quantified affirmative [thus: 'Every C is an A']; and you have [the premises] 'Every D is a B' and 'Every B is an A', and 'Every C is a D' is attached, this makes [the syllogism] *ḥāsil.*
[Example 38.] If the goal is universally quantified negative [thus: 'No C is an A'], and the found [premises] are 'Every D is a B' and 'No B is an A', and 'Every C is a D' is attached, this makes [the syllogism] *ḥāsil.*
466.9   [Example 39.] If the found [premises] that you have are 'No D is a B' and
466.10   'Every A is a B', and 'Every C is a D' is attached, this makes [the syllogism] *ḥāsil.*
[Example 40.] If you have [the premises] 'Every D is a B' and 'No A is a B', and 'Every C is a D' is attached, this makes [the syllogism] *ḥāsil.*
[Example 41.] If the goal is existentially quantified affirmative [thus: 'Some C is an A'], and you have [the premises] 'Some B is a D' and 'Every D is an A', and 'Every B is a C' is attached, you can use [the syllogism].
Example 42.] If you have: 'Some B is a D', and 'Every A is a D', [the syllogism] can't be used.
[Example 43.] If you have 'Some D is a B' and 'Every B is an A', and [the attached premise] is 'Every D is a C', you can use [the syllogism].
[Example 44.] If you have 'Some D is a B' and 'Some A is a D', [the syllogism] can't be used, even with the order [of the premises] reversed.
466.15   [Example 45.] If your goal is existentially quantified negative [thus: 'Some C is not an A'], and you have [the premises] 'Some B is a D' and 'No D is an A', and /467/ 'Every B is a C' is attached, you can use [the syllogism].

[Example 46.] Or you have 'Every B is a D' and 'Some D is not an A' —
then you can't use [the syllogism].
[Example 47.] If you have [the premises] 'Not every B is a D' and 'Every D
is an A', you can't use [the syllogism].
[Example 48.] If you have 'No B is a C' and 'Some D is an A', you can't use
[the syllogism].
[Example 49.] If you have 'Some D is a B' and 'No A is a B', and 'Every D
is a C' is attached, you can use [the syllogism].
[Example 50.] If you have 'No D is a B' and 'Every A is a B', and 'Some C 467.5
is a D' is attached, you can use [the syllogism].
[Example 51.] If you have 'Not every D is a B', and 'Some A is a B', [the
syllogism] can't be used.

   Try out for yourself the compound [syllogisms] where the overlap is   467.7
with the predicate of the goal, in the same relation as above.

   These, and similar [examples] that we handle by comparison with them,
are instances of analysis where you have two premises.

   [9.6.11] [Example 52.] In the case where you have a single premise,
which overlaps the predicate of the conclusion, and the goal is univer-   467.10
sally quantified affirmative, namely 'Every C is an A', and you have [the
premise] 'Every D is an A', then if 'Every C is a D' is attached, this makes
[the syllogism] *ḥāsil*.
[Example 53.] If you have 'Every A is a D', [the syllogism] can't be used.
[Example 54.] If the goal is universally quantified negative [thus: 'No C is
an A'], and you have [the premise] 'No D is an A' or 'No A is a D', and
'Every C is a D' is attached, this makes [the syllogism] *ḥāsil*.
[Example 55.] If you have [the premise] 'Every D is an A', then [the syllo-
gism] can't be made *ḥāsil*.
[Example 56.] Rather, if you have 'Every A is a D', and it's true that 'No C 467.15
is a D', this makes [the syllogism] *ḥāsil*.
[Example 57.] If the goal is existentially quantified affirmative [thus: 'Some
C is an A'], and you have [the premise] 'Some D is an A', and 'Every D is a
C' is attached, you can use [the syllogism].
[Example 58.] If you have [the premise] 'Every D is an A', and 'Some C is
a D' is attached, you can use [the syllogism].
[Example 59.] If you have 'Some A is a D', you can't use [the syllogism] at
all, unless you convert.
[Example 60.] If the goal is existentially quantified negative [thus: 'Some C

is not an A'], and you have [the premise] 'Every D is an A', you can't use [the syllogism] at all.

[Example 61.] Rather, if [the premise] is 'No D is an A', and 'Some /468/ C is a D' is attached, you can use [the syllogism].

[Example 62.] Likewise if [the premise] is 'No A is a D', and you have 'Some D is an A' or 'Some A is a D', [the syllogism] can't be used.

[Example 63.] If you have [the premise] 'Not every D is an A', and 'Every D is a C' is attached, you can use [the syllogism].

[Example 64.] If [the premise] is 'Not every A is a D', [the syllogism] can't be used.

468.5

[9.6.12] When you put the steps in this order, as I have shown you, you will have learned the [required] terms, figures and moods. And the terms that you encounter will be ones within the formats mentioned above as ones that can be used.

468.7

Apply exactly the same considerations to propositional compounds.

8.5   *Qiyās* ix.7

ix.7 A remark on syllogistic constructions whose analysis is
difficult, and an explanation of ways of making the analysis easier

[9.7.1] /469/ The analysis of a deficient syllogism is often difficult, when   469.4
a conclusion is drawn in the mind from the explicit wording of the syllo-
gism, so that the soul feels no need to complete it and reduce it to how it   469.5
should be, believing that it is [already] complete. But then [when it looks,]
the soul simply can't find the feature that needs to be there between the
conclusion and the premises, bringing the conclusion into genuine associa-
tion with the syllogism.

[9.7.2] An example of this is when one says: 469.7

(8.50)   When the parts of a substance are nullified, so is the substance;
         and a substance is not nullified by nullifying something that is
         not a substance.

Or we say:

(8.51)   When the parts of a substance are nullified, the substance is
         thereby nullified; and the nullification of something that is not
         a substance doesn't bring with it the nullification of a substance.

It follows from this that the parts of a substance are a substance. Hear-   469.10
ing the syllogism, the mind has no doubt that this follows from it, so it
thinks that this is a complete syllogism. But then one can't analyse it and
refer it to the syllogistic figures in such a way that the goal follows from
it. This causes the mind to lapse into dumbness. Sometimes in cases like
this the goal follows from the proximate conclusion of the syllogism, either
by a conditional where the first clause entails the second, or by deducing
the conclusion from something implicit. The point is that this latter syl-
logism [with an added step] really is productive. Taking the first of these
approaches, from   469.15

(8.52)   The parts of a substance are not a non-substance.

it follows, by using an entailment, that

(8.53)   The parts of a substance are a substance.

Taking the other approach, given that

(8.54)   The nullifying of the parts of the substance doesn't nullify [any] non-substance.

/470/ one adds to it

(8.55)   A thing such that its nullifying is not the nullifying of [any] non-substance is a substance.

and then there follows:

(8.56)   The parts of a substance are a substance.

470.3   [9.7.3] And sometimes the syllogism reverts to entailing the goal through a very slight switch-over which is applied to one of the premises, where the premise had been taken in the syllogism, not in a way which entails the re-

470.5   quired goal, but rather in a way which entails some sort of conversion or contradictory conversion, or something else like that. So when the syllogism returns to the required [form], it becomes easy to analyse. In fact when this premise:

(8.57)   The nullifying of a non-substance doesn't nullify [any] substance.

is turned around so that it becomes:

(8.58)   Everything whose nullification nullifies a substance is [itself] a substance.

it follows directly that the parts of a substance are substance[s].

[Transitivity of implication]

470.8   [9.7.4] Likewise if
someone were to say:

(8.59)   'If [HUMAN] holds [of it] then [ANIMAL] holds [of it]' and 'If [ANIMAL] holds [of it], then [SUBSTANCE] holds [of it]' entails 'If [HUMAN] holds [of it] then [SUBSTANCE] holds [of it]'.

It has been said that this is difficult to analyse, and that the discourse has several aspects which make it difficult to analyse. One of them is that this construction can occur only with a pair of propositional compounds, and

not with a pair of predicative statements. Nevertheless no duplicative in-
ference occurs in it, so it is not a syllogism, even if it looks like a syllogism.
Another aspect is that the intention [of the argument] is to derive that a
human is a substance; but that doesn't follow from this [argument]. And
another aspect is that these two [premises] are unquantified. It's surprising
that anybody should say this, because it obscures the truth, [that] the only
propositions that are recognised as resulting from the removal of quanti-
fiers are predicatives.

[9.7.5] It's appropriate that you should bear certain points in mind when   470.16
dealing with arguments like this. First, the goal is true. Second, [the goal]
does follow from that discourse. And third, there are two ways in which
the discourse can fail to entail [the conclusion]: either /471/ it is not a
syllogism, or it is a syllogism but it entails something different.

[9.7.6] These are things that will have to disappear as we pursue this   471.1
syllogism, because this syllogism is a syllogism composed of two meet-like
propositional compounds, and the goal is a meet-like propositional com-
pound which is entailed by exactly these premises. So the only possible
blemish in this syllogism is that it might be said that the two premises
are not quantified like predicative propositions, but in the way that ap-
plies to propositional compounds; you already know this. So [the syllo-   471.5
gism] needs to be corrected, so that instead of 'If' it has 'Whenever'. But
the First Teacher, when he mentioned 'whenever', just mentioned it and
didn't explain it as an introduction to the propositional compounds. So it
seems reasonable that the meaning of 'if' is that in this case we have conse-
quences that are entailed, but not by one of the [other] kinds of syllogism
that you learned about. So it is not possible to analyse those consequences
into the former [sort of syllogisms] until you know that the 'whenever'
[clause] won't have something following from it by the form of the syllo-
gism that you know, just as it is; but rather [the consequence would be]
by a different recombinant syllogism. And when one wants to to analyse   471.10
it into the predicative propositions which you know about from this book,
one can't take it as it is, but rather [it has to be taken] with a certain kind
of modification, namely a translation into predicative propositions, like the
two propositional compounds in this case.

(8.60)   Every human is an animal and every animal is a substance, so
         every human is a substance.

[Our original syllogism] entails:

(8.61)   If it is a human then it is a substance.

471.15

This latter syllogism is a piece of discourse that does entail what was taken to follow from it, but it doesn't analyse to the syllogism that you know. And when one contrives to analyse to it as we have said, (8.61) follows from it too, but not as its primary consequence. So when it is taken on the basis that this is its conclusion, /472/ it can't be analysed together with the conclusion, because when it is analysed in its own right, its conclusion is something different. Our conclusion follows from its conclusion.

472.3

[9.7.7] This is the [best] explanation I can give for this example. This and similar cases belong to a type where the thing gives the impression of being a syllogism that proves something, when it is not really a syllogism proving that, though it has this feature to such an extent that one has no
472.5
doubt that that thing does follow from it.

472.5

[9.7.8] It can happen that an idea [in the argument] is misleading in itself, rather than in relation to something that one thinks will follow from it. This happens when the terms look like the terms of a syllogism, but there is a violation of one or more conditions that are attached to the terms in the form of quantifiers, copulas or other things. [The argument] is invalid and nothing follows from it, though one thinks it is a syllogism. An example of this is that

(8.62)   Zayd is imagined as Zayd, and a thing that is imagined as Zayd can be eternal.

472.10

The comment made on this is that the cause of the error is that the major premise is not universally quantified, bearing in mind the requirement that the major premise has to be universally quantified for [the syllogism] to be valid. This [major premise] is not universally quantified but unquantified. If you said it with universal quantification, then it would say:

(8.63)   Everything imagined can be eternal.

which is a false statement. The comment deserves to be investigated.

472.13

[9.7.9] We say: someone might well say: The major premise is not un-quantified but singular. And he might well say: It is reasonable to claim that syllogisms composed of singular sentences can be productive even
472.15
when their major premise is not universally quantified. Thus when it is

said:

(8.64)   Zayd is this person sitting down, and this person sitting down is
         white

it always follows that

(8.65)   Zayd is white.

A [major premise that is] not universally quantified yields an invalidity
only when it is actually or potentially existentially quantified.

[9.7.10] One possible case is that the minor term is an altered form of   472.17
the middle term. /473/ but in this particular instance the minor term is
absolutely not an altered form of the middle term. Then if we were to say:

(8.66)   Zayd is imagined Zayd.

where imagined Zayd is an individual, and then we repeat (8.66) [giving
a different argument], and it is true that the thing imagined as Zayd can
be eternal, and what is meant by it is this 'imagined as Zayd', then the
syllogism would be valid, and the sentence that is supposed to follow from
it would follow. But if we said:

(8.67)   This thing that is imagined to be Zayd can be eternal.

it is false. So the discourse will not have entailed a truth, because its major   473.5
premise is false, and not because of what has been said.

[9.7.11] One should understand that someone else might say: The phrase   473.6

(8.68)   the thing imagined as Zayd

could be understood as having either of two meanings. One is an idea
which is satisfied in the external world, and which has added to it in the
mind a form, and it also has added to it a shape which its form its a copy
of. This is analogous to how one says 'perceived thing' for a thing in the
external world, and the perception of the thing is taken as its form. But it
can also be understood as meaning the actual form in the imagination, so
that it is something imagined about Zayd. [The statement] that adds 'can   473.10
be eternal' to the first meaning is one that we can understand in several
ways. Thus (1) we can understand it [as saying] that [Zayd] himself exists
for ever. Also (2) we can understand it [as saying] that he exists for ever in

79

the imagination. And (3) we can understand it [as saying] that in our imagination we judge that he exists permanently, not meaning that he is like this himself in the world, nor that he stays in the imagination permanently, but rather that even if he stays in the imagination for only a short time, during that time he will have been imagined to exist for ever. The sentence and the verbal expressions are true depending on which of these various meanings correspond to them.

473.15

[9.7.11]

> 473.15 'The truth of the sentence': This sentence appears in the Cairo edition as a clause at the end of the preceding paragraph. It makes little sense there, but it clearly refers to the topic of paragraph [9.7.11]. Even in its new position it is hard to parse, but there seems little doubt what it needs to say at this point — unless it's just a marginal note and should be deleted. I assume the text is damaged, and originally it read along the lines *wa-'ammā l-ṣidq fa-huwa ṣidq al-'alfāḏz* etc.

474.1

/474/ [The expression] that corresponds to the first meaning is:

(8.69) The thing that gives rise to its form in the imagination exists in the material world for ever.

[The expression] that corresponds to the second meaning is:

(8.70) The thing that gives rise to its form in the imagination has its form remaining in the imagination permanently, whether or not the thing itself continues to exist.

[The expression] that corresponds to the third meaning is:

(8.71) The thing/person who has caused his form to be in the imagination is judged to be existing for ever in the material world, by a judgment in the imagination.

474.5

in such a way that the judgment is in the imagination, but it is in relation to the external world.

474.6

[9.7.12] Now let us suppose that our sentence

(8.72) What is imagined as Zayd is eternal.

or

(8.73)   It is possible that [what is imagined as Zayd] is eternal.

has a universal meaning as its subject. If [the sentence] means the first meaning, then the proposition is false. If it means the second meaning, then again the proposition is false. If it means the third, then there is a restriction on how one should understand it, since the meaning of the sentence

(8.74)   What is imagined as Zayd is eternal.

is expressing the content of the imagination, and so 'eternal' has to be taken   474.10
like that in the conclusion [too]. Then the conclusion is not false but true.

[9.7.13] The reason for the falsehood of the conclusion is not the point   474.11
that Aristotle himself pursued, namely that the terms are taken in one way
in the premises and in another way in the conclusion. But
they are arranged in the syllogism in a bad way. We need to express an
opinion about that now.

[9.7.14] So we say: [Aristotle's] phrase   474.13

(8.75)   imagined as Zayd

means something that can be understood as a universal in a certain way.
Namely, we can understand it as saying that this thing has a form which
it gives rise to in the imagination, and the form is ascribed to it. Speaking   474.15
of the general imagination, it can happen that something other than Zayd
is imagined to be Zayd, regardless of whether this is true or false. Being
imagined and being truthfully imagined are not the same thing. There is
nothing far-fetched about Abdullah being imagined to be Zayd; this can be
both imagined and false. This is like saying

(8.76)   Zayd is said to be so-and-so.

It can happen that [Abdullah] is in fact Abdullah but is said to be someone
else. Thus it can be said both that /475/ so-and-so is Zayd, and that so-
and-so is not Zayd; though only one of these would be true. There is a
difference between the thing being said and its being true, and the same
goes for its being imagined and its being true. When the syllogism is read
this way, the middle term is a universal.

[9.7.15] Next, suppose it can happen, in cases like this, that 'imagined' is   475.4

taken to refer to the essence and the form of Zayd, given that both of these 475.5
have a link to the imagination, and that we can count just one of the two
as possibly eternal, namely whichever one is in the imagination, and count
the other as not like this in terms of how it can exist. The result is that when
we say

(8.77)   It is possible that he is eternal.

(in terms of the possibility of whatever kind of existence he has), then it is
true that

(8.78)   Something that is imagined as Zayd can possibly be eternal.

(in terms of the possibility of the kind of existence that it has). But suppos-
475.10   ing that the other one is not like that, then when one says

(8.79)   Everything that is imagined . . .

this applies to both parts and so what it says is false. But when it was
taken as unquantified it was true. So here is the cause, and this is the form
that it takes. The reason why the entailment fails is just that the syllogism
is taken in a way which doesn't entail so long as is its major premise is
unquantified. This way of taking it allows the lesser term to lie outside the
part of the middle term that the greater term is true of.

475.14   [9.7.16] And this what the First Teacher was getting at. If you chose to
475.15   take the middle term as a particular and not as a universal, this would be a
different interpretation; in that case the content which we are considering
now would be changed. The First Teacher wasn't thinking of cases like this,
where the terms are not taken as universal according to that convention. If
you contrive a way of making the major premise true while restoring it to
being universally quantified, /476/ by saying

(8.80)   Everything imagined to be Zayd can be judged in the imagina-
tion to be eternal.

then the conclusion is not false. But our concern is not with this, but rather
with [the syllogism] whose conclusion is not true.

[Zayd the singer]

[9.7.17] There is another example that can be taken after this one. Con-
sider the sentences

(8.81)   Zayd is Zayd the singer.

and

(8.82) Zayd the singer won't survive till tomorrow unless the singing survives.

Then the combination of the two meanings [ZAYD] and [THE SINGER] won't continue to be satisfied if one of the two meanings doesn't continue to be satisfied. In this example one has to understand that [ZAYD THE 476.5 SINGER] is also a universal. This is because [ZAYD] describes only a single person, whereas the meaning [ZAYD THE SINGER] can be true of many different things. And this is because [ZAYD THE SINGER] is a particular singer with a particular singing. We could find him an hour later still Zayd, but no longer singing, so that he wouldn't still be Zayd the singer. Then he can become Zayd the singer again. But we wouldn't be referring [to the new singing] as numerically the same as the previous singing; it would be a different thing of the same species. Regarding him as Zayd, he is that 476.10 same individual; but regarding him as the combination of Zayd and being a singer, he is not numerically the same as the previous one. He would only be the same as the previous one if it was the same Zayd and numerically the same singing.

[9.7.18] This is like a brick made out of mud, then it gets broken up, 476.12 and then it is restored. This brick is not the same brick as before, even if its mud was this same mud; but rather the second brick is a new thing and not the same thing as the old brick. In the same way, given that the second singing is not numerically the same as the first singing, the second meaning [ZAYD THE SINGER] is not numerically the same as the first 476.15 meaning [ZAYD THE SINGER]. A thing can change its essence through its behaviour, as you know. Things which are different can't be taken as numerically the same thing; so the first [ZAYD THE SINGER] can't be one and the same subject as the second one.

[9.7.19] /477/ Given that the middle term is a meaning which is not a particular, the major premise is appropriately taken as being true when 477.1 universally quantified. So in the phrase

(8.83) Zayd the singer

the word 'every' can be introduced, so it is as if you said:

(8.84) Everything that fits the description [ZAYD THE SINGER].

And you already know that this means that things are asserted of Zayd the singer, since you know that when we say

(8.85)   Every C is a B.

477.5

it means that

(8.86)   Everything that in actuality fits the description C is a B.

There is no condition saying that this holds so long as the thing continues to fit the description C, or [that it holds] at some other time. One of the things that are asserted of [ZAYD THE SINGER] is [that he is] Zayd taken absolutely. A second thing is that he is [ZAYD THE SINGER]. These two are different, and [ZAYD THE SINGER] is a predicate holding of both of them. So it is false to say: Everything that fits the description [ZAYD THE SINGER] is asserted of the meaning [ZAYD THE SINGER], it is in fact false

477.10

tomorrow, but some of that, namely what is Zayd the singer, insofar as he is Zayd the singer. And as for everything that fits the description [ZAYD THE SINGER] being asserted of Zayd the singer: it is not the case. In fact Zayd, [taken] absolutely and without any condition that in fact he is Zayd the singer — and I am not saying under a condition that he is not in fact Zayd the singer — is one of the things that fit the description [ZAYD THE SINGER]. This is like the fact that a human, considered just as himself and even no condition is made imposing the consideration that he is white, may in fact fit the description 'white'. Thus in fact when you say

(8.87)   Zayd is coloured white.

477.15

the subject is taken as just Zayd with nothing added. And likewise he can be described by taking him as combined with being coloured white, as in the sentence

(8.88)   Zayd the white is coloured white.

When he is taken together with 'coloured white' the predication is necessary, with the modality that you know. But when he is taken absolutely, being coloured white is predicated of him [only] absolutely. This kind of universal quantification is not over the individuals but over [the individuals together with] their circumstances. You have already been made aware of /478/ this more than once.

478.1

[9.7.20] So in fact 'Zayd' taken as [ZAYD] is one thing, and 'Zayd' taken

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as as [ZAYD THE RICH] is another thing. When we say

(8.89)   thing that fits the description [ZAYD THE RICH]

that's another thing, and it fits both the first two cases. This is because Zayd can be considered as being Zayd, considering him without any addition, but he can also be considered together with making it an added condition that he is a singer. This doesn't falsify the fact that Zayd is an individual, because he is an individual when he is considered just as Zayd, when the 478.5 only condition on him is that he is a singer.

[Health and disease]

[9.7.21] Now that this has been clarified, when you take the major premise478.6 as unquantified you imagine it as true, but when it is counted as universally quantified it is false. These two examples illustrate the situation where the terms are taken in an appropriate order, but there is something confused about how they come to be quantified. There are also cases where the confusion appears in the way the terms are coupled together. And that is because sometimes one gives expression to the syllogism by starting from the predicates, but in these cases one also needs to add an expression which doesn't occur in the terms, and this is just a copula or something resem- 478.10 bling a copula. The result is that an ambiguity occurs in it, as when one says:

(8.90)   Health is not in any disease,
          and disease is in every person.

[9.7.22] The following comment was made: It might be thought that 478.12 it results from this [pair of premises] that it's impossible for health to be in any single person. But someone might say: This person took the conclusion to be a necessary proposition, and this is something that doesn't follow from the syllogism as he has it, even if it is a syllogism. What is reckoned to follow from it is that health is not in any person. And this is true in 478.15 the same way as the minor premise in the syllogism is true, namely that disease is in every person. If you take the minor premise as possible, then accordingly this [conclusion] is possible; and you will have judged that this syllogism entails a possible proposition. If the minor premise is taken as absolute — which is legitimate — then this conclusion /479/ can also be legitimately taken to be an absolute proposition. Our own reaction to this 479.1

is that the conclusion is being taken as necessary and the major premise as   479.1
necessary. The minor premise is being taken as possible, particularly since
479.3   in the First Teaching he has raised the question of the truth of the minor
premise in the context of capability, and capability means not that one is
such-and-such, but that it's possible for one to be such-and-such. But in
479.5   fact it is true in the absolute sense that every person suffers illness, since
every person is mortal and every death is preceded by illness, even if for an
insignificant amount of time. According to the syllogism it is health that is
said to be necessarily not true of any disease. And if you want, you can say
that disease is possible, or if you want you can say that it is found in every
person. Then if you take the minor premise as absolute, the conclusion has
to be necessary in the sense that it does occur in all cases. If you take the
minor premise as possible, the conclusion just is a necessary truth, even if
479.10 not everybody agrees with it. It should be understood that the First Teacher
indicates that he takes the minor premise as possible, and that implies that
his opinion is the one above. But he says what he says about the mixtures
[of modalities] for purposes of examination.

479.12   [9.7.23] The next point is that in fact the necessary conclusion is false.
What makes it false is that the expression 'in' in the major premise signifies
something like a copula. That makes it correct for us to say:

(8.91)   No disease is healthy.

But in the minor premise the expression 'in' is a part of the predicate. This
479.15 is why we don't express the premise as

(8.92)   Every person is a disease.

Rather we say

(8.93)   Every person has disease in him.

So the expression 'in' in the major premise signifies a predication, [while]
the expression 'in' in the minor premise doesn't signify /480/ that the mid-
dle term ['disease'] is predicated of the minor term ['person'], but rather
that [the former] is found in [the latter]. If the minor premise was corrected,
for example to

(8.94)   Every person has disease in him, or is ill, or has a disease.

and then it was said:

(8.95)   Nothing which is a disease is healthy.

that wouldn't be a syllogism. If it was re-corrected to

(8.96)   It is not possible that a thing that is ill is health.

it would entail a truth, namely

(8.97)   No person can be health.

So if one was going on to infer something impossible, namely that no per- 480.5
son can be healthy, the major premise would have to be

(8.98)   Nothing that is ill can be healthy.

But this proposition is false.

   [9.7.24] This is a kind of error that occurs when states are taken in place 480.7
of the capability of being in those states, so that 'health' is taken instead of
'healthy', and 'disease' instead of 'being potentially though not actually ill'.
These are kinds of errors that occur because of things that are attached to 480.10
the terms for example: quantifier, being unquantified, copula.

8.6   *Qiyās* ix.8

> ix.8 Identifying some other ways of considering the terms [of premises], and the content [of the premises] in itself rather than in relation to the conclusion, so as to simplify analysis.

481.5

[9.8.1] /481/ Now let us introduce various considerations which you need to bear in mind if you don't want the analysis [of a syllogism] to be impossible. These considerations concern the terms themselves and the [propositional] content itself, not the relation [of the terms and content] to the conclusion. Also they are not concerned with the things that are attached [to the terms]. One consideration that is about the terms themselves is this: the terms can be compound expressions rather than atomic ones. For example the minor term can be not 'human' but 'animal that is rational and mortal'. In such cases the atomic expressions in the terms can confuse

481.10

you, because you find more than three of them, and this can make it hard for you to separate out the terms from one another. You should make an effort to find atomic nouns to stand for each of the noun phrases; but if you fail to find them, there is no obligation on you to place atomic nouns for each of the noun phrases. Sometimes it's appropriate to put a different atomic noun in place of a given one. [Sometimes it's appropriate,] for example, for you to correct what is said in the light of how you take it to be meant.

481.14

[9.8.2] The point that one should understand from the examples given for this is not the one made by the shaikh of the Christians in his com-

481.15

mentary, nor that in the commentary of the best of the later ones. What [Aristotle] was saying was this. Suppose for example that you want to give a demonstration, and so you make the minor term 'isosceles triangle', the middle term 'triangle' and the major term /482/ 'having [the sum of its internal] angles equal to two right angles', the reason being that you need to demonstrate [that this property holds] for isosceles triangles because it holds for triangles — [you go via] this notion 'triangle' because it is primary, in the sense that the reason why it has the [required] property is not that something more general than it has the property, even if there is a middle between [it and the property]. The thing that you make clearly understood, which is the major term, is a discursive statement, not an atomic expression. So be aware that sometimes the middle term is not an atomic

482.5

expression, but a compound one, in the same way as this major term. Thus

if you seek to make the middle term atomic, then in general your problem of clarification has no solution.

[Terms with a removable preposition]

[9.8.3] And you need to take a close look at the behaviour of expressions   482.6
that are particles, and [more generally] those expressions that are like par-
ticles in the sense that their proper role is to be a part of the whole predicate
or subject.
If you fail to pay proper attention to them, the same thing happens as we
mentioned above. For example, suppose you say:

(8.99)   There is a single knowledge about [any pair of mutually] con-
            trary [statements].

or

(8.100)   Goodness is true of wisdom.

The expression 'about' in (8.99) is a part of the predicate, because (8.99)   482.10
means

(8.101)   Every contrary [pair of statements] has a single knowledge about
            them both.

But the particle 'of' in (8.100) is not a part of anything; rather it is a parti-
cle that signifies the copula. When you find something of this kind in the
terms, check whether it is a part [of a term]. [If it is one,] then keep it as
a part and add it to the connected whole, making a single term out of the
two parts. But eliminate the other [kind of expression], by rearranging the
proposition in such a way that you don't have to use it. Thus if you said
(8.100), you would need the preposition 'of'. But if you said   482.15

(8.102)   Wisdom is good.

you wouldn't need it, and so you can tell that the preposition is certainly
not a part of a predicate. But in the case where you said (8.99), /483/ and
then you said [instead]:   483.1

(8.103)   [Mutual] contraries, there is one science about them.

you would still need the expression 'about' or another expression that serves
the same purpose.

[9.8.4] It can happen that there is some expression like this that occurs 483.2
in both the minor term and the major term, signifying a part [of the term],
as when you say

(8.104)   Every quality has an act of ascribing it, and everything that has
          an act of ascribing it has something that it is ascribed to, so every
          quality has something that it is ascribed to.

483.5 Sometimes the thing is different in the two premises, in such a way that the
occurrence that points to a part is in the major premise and the other is in
the minor premise, as when you say:

(8.105)   Every quality has a knowledge of it, and every white colour is a
          quality.

And sometimes it's the other way round, as when you say

(8.106)   'Good' is true of knowledge, and for every quality there is a
          knowledge about it.

This doesn't happen just in affirmative sentences. It happens also with
negative ones, as when you say:

(8.107)   Becoming is not true of becoming.

and

(8.108)   Movement is not in movement.

483.10   If you take both the expression 'of' and the expression 'in' to signify pred-
ication, then (8.107) and (8.108) are both false. If you take the prepositions
to be parts of the predicates, both sentences are true. So when you say

(8.109)   Becoming is not true of becoming, and every pleasure is a be-
          coming.

taking the 'of' in the major premise [of (8.109)] as part of the predicate, it
follows from this that pleasure doesn't become. This is correct, since every
pleasure is a becoming, and becoming doesn't become. But if you take the
'of' to signify predication, it's not correct for you to say

(8.110)   Becoming is not true of pleasure, or is not [truly] predicated of it.

483.15   Likewise signs don't have signs, and laughter has/is a sign. And likewise

God has time, but God doesn't need to have occasions.

[9.8.5] A way to avoid things of this sort is to speak the premises in the order that is normally used. Even if occasionally the way that the terms were posited requires you /484/ to say

(8.111)   [ANIMAL] is predicated of [HUMAN] and [HUMAN] is predicated of [WRITER].

the normal usage of the premises doesn't require you to say them that way. It's not how you would normally say them when you use the syllogism, either in writing or in speech. Rather, you would say

(8.112)   Every writer is a human, and every human is an animal.

and [by saying them in this way] you will have escaped from the problem of having things added to the terms.

[9.8.6] One can make an error about the terms because of conditions which are really parts of the terms but are not stated explicitly, or because there is something contentious about the way they are made explicit. All such things need to be made explicit and genuinely present [in the terms], and then you can attempt the [rest of the] analysis. An example of this is the sentence

(8.113)   We don't know what an infinite thing is.

Strictly this sentence is not true, because if the infinite thing is a number, we do know what it is insofar as we know what numbers are; we just don't know what it is for it to be infinite. Being infinite and being a number don't mean the same thing; so you need to make an addition to the sentence [and make it say]

(8.114)   We don't know what it is for an infinite thing to be infinite.

Or consider the sentence

(8.115)   The human can perceive.

This doesn't need that kind of addition. But know that sometimes a sentence is true when taken without a condition, and adding a condition makes it false. Thus it's true that the human can perceive, but it is not true that the

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human can perceive the soul. Or it can be that a sentence is false without a condition, as when you say:

(8.116)   The human — you won't find.

But if you said

(8.117)   [The human —] you won't find anything like him.

484.15

it would be true. And another case is where something wouldn't be true under a condition that is included in it if it weren't [also] true without any condition. Thus anything that is the property of Zayd has to be property; and whatever is ᶜAmr's right hand is a right hand. If the broader meaning wasn't true of the thing, the narrower meaning wouldn't be true of it either. Then there are things that are true taken on their own but false in a compound, or true in a compound but false on their own. This is something that you already know and you have verified how it goes.

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[9.8.7] /485/ Know that one of the terms can appear more than once [in a proposition]. One might reckon this repetition occurs just in the context 'X insofar as it is X'. But in fact that's not the case. [The repeated expression] can occur once as a term in inside a term, and then as part of another term. When the repeated expression is the middle term, it often appears in three places: in the middle term, and in the major term

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[both in the major premise] and in the conclusion. For example:

(8.118)   Just things are good, and everything good is known to be good, so just things are known to be good.

Here 'good' is sometimes the middle term, and at other times it is a part of the major term.

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[9.8.8] And likewise the statement:

(8.119)   A such-and-such line is infinite, and anything infinite is not known in respect of what it is to be infinite, so the conclusion is that the such-and-such line is not known, not absolutely but in respect of what it is to be infinite.

So if someone were to say that the way the expression 'it is not known' is normally understood is more inclusive than the normally understood meaning of the expression 'it is not known in respect of what it is to be

infinite', then it would be correct to deduce [the former expression] 'it is not known' from the latter. We would add to this that the expression 'It is not known' is more inclusive than the expressions 'Its essence is not known', or 'It is not known as a line'. So when one deduces 'It is not known' and stops there without going on to explain in what respect the thing is not known, then one of two things must be the case. The first case is that this expression behaves like a copular verb, which is neither true nor false when it is predicated [of something], like the expression

(8.120) It isn't

which is used to mean a copula — not the self-contained 'being' which doesn't need a single grammatical object to complete it, but the one that does need a single grammatical object to complete it. If it is like that, then 485.15 also when we say 'It is not known', this needs [to be expanded as] 'It is not known that … whatever is not known [about it]', not just 'It is not known'. The same applies to the statement 'It is not believed'. So [in this case] the supposed conclusion [of the argument] is not a conclusion because it has no truth-value and it conveys no information. The other case is that /486/ its predication is self-sufficient and independent. If its predication is self-sufficient and independent, then the condition for it to be true is not the same as for the truth or falsity of the sentence:

(8.121)   It is not known as a line.

Rather it has a more inclusive meaning, as if it said

(8.122)   There is some respect in which it is not known.

But people giving syllogisms don't always go down this latter route; they are more likely to say something that distinguishes [the relevant aspect]. Sometimes the topic under discussion requires it, so that if [the relevant respect] wasn't stated, the thing would be obscure. Even if the phrase could be interpreted as self-sufficient, the thing would become obscure when this interpretation didn't fit [the rest of the argument].   486.5

[9.8.9] Know that whenever the phrase 'in respect of' is used, it belongs 486.6 in the predicate and not in the subject. So when you say

(8.123) C is etc., in respect of what C is.

the second C is part of the predicate, not of the subject. This is why the person who said the following was leading us into error:

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> A thing that is X-insofar-as-it-is-X is either Y in its own right, or it is not Y in its own right. If a thing that is X-insofar-as-it-is-X is not Y in its own right, then nothing that is X could be Y in its own right. And likewise if a thing that is X-insofar-as-it-is-X is Y in its own right, then everything that is X would be Y in its own right. This is absurd.

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487.1
But this ignores the fact that the opposite to the affirmative one of these two cases is not what he said. Rather it is that the thing is not 'X in its own right insofar as it is X'. So the negation goes with the combination of 'X in its own right' and 'insofar as it is X'; the expression 'insofar as it is X' forms a part of the predicate, and so no impossibility follows. In all such cases one has to take the second occurrence of the phrase as inside the predicate as a whole. [[So if it is in the middle term in some specific syllogistic mood, it occurs also in the major term.]] If the thing can't be taken in this way, then the piece of discourse [under discussion] is meaningless and doesn't analyse into any syllogistic mood. /487/ Another example of the same kind is:

(8.124) The human is perceived, and every perceived thing is lacking in respect of its being perceived.

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[9.8.10] In arguments like this, whenever you want to infer something by using a condition, you should [try] taking the middle term to contain the major term together with the condition, and then you can analyse it. If you have an inference that works correctly without a condition, then take it without a condition and analyse it. An example of the first is that if you want to infer that the good is something known, then say: because it is something [known] to exist. If you took 'known', then take [with it]: 'to exist'. If it leads to a dead end, then replace the expressions with whatever you want.

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[9.8.11] In some cases there is a suppression of a part of the constructed expression where it wasn't something you chose because of your main aim, and you only included the thing in order to prove something extra, and not because you needed it. if you can drop the item without affecting the meaning, drop it and then analyse. Thus you might want to deduce

(8.125) X is imagined.

using the middle term 'believed', so you say

(8.126) The imagined is a genus for the believed, and also X is believed.

But the genus is included between the terms. Your only reason for includ- 487.10
ing it was to indicate the truth of the statement that what is believed is
imagined. Then no harm is done to the inference if you drop [mention of
the genus]; so drop it so that the discourse can be analysed into a syllogism.

[9.8.12] Sometimes the contrary happens, and the suppression of some 487.12
small detail causes a major contradiction, just as the introduction of some-
thing can cause a major contradiction. Thus when you say

(8.127)   Pleasure is good.

it is meaningful. And when you say:

(8.128)   Pleasure is the good.

 that's meaningful [too]. But there is a huge difference between the two 487.15
meanings. Of course there is: the first of the two is true on the assump-
tion that pleasure is good, but the second is not true, since it requires that
describing something as the good is equivalent to describing it as pleasure
(لِلَّذَّةِ?). Similarly a person who wants to infer that pleasure is good will
have to take the major term as 'good', without the definite article; whereas
if he wants to infer that pleasure is the good, then he has to take as his
major term the same major term but with the definite article added.

[9.8.13] Someone might well /486/ say: There is a flaw in this argument. 487.19
Suppose B is the middle term, so we have

(8.129)   Pleasure is B.

Then you will need to say either

(8.130)   Every B is the good.

or

(8.131)   Some B is the good.

or you say

(8.132) B is the good.

Now if you said

(8.133)   Every B is the good.

then it's as if you said

(8.134) Each thing that is B is all of the good.

and this is false. If you said

(8.135) Some [B is the good].

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the major premise would be existentially quantified. And if you took the unquantified sentence (8.132), the major premise would be unquantified and wouldn't have any consequences.

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[9.8.14] So we say in answer to this: An unquantified statement in convertible matter does have consequences. That is because the predicate in it is not restricted to part of the subject as opposed to the (whole) subject, but rather [it applies] to all of the subject, and at the same time the subject is asserted of all the predicate. The minor premise [(8.129)] is not reversed, but rather the minor premise also has to be convertible, and it's impossible for it not to fit this same description [that we gave for the major]. In this

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matter there can be a syllogism consisting of two unquantified premises, saying

(8.136) Pleasure is B (as above), and B is the good.

Then these [terms] will all be equivalent to each other. Thus the [propositions] can be converted into the forms

(8.137) Every pleasure is a B, and every B is a pleasure.

and

(8.138) Every B is good, and every good thing is a B.

But when we say

(8.139) Every good is B.

it doesn't give the same information that is given when we say

(8.140) All of the good is B.

The sentence (8.139) pays regard to the things that fit the description 'good', while (8.140) pays regard to the nature of [GOOD] itself. The sentence (8.139) doesn't yield equivalences, whereas (8.140) does yield equivalences.

15   So (8.140) tells us also that B is true of everything that fits the description 'good', in addition to telling us that 'all of the good' is true of everything that fits the description B. This second piece of information can't be inferred from the statement [(8.139)] about 'every'; what can be deduced from that statement about 'every' is just that the predicate holds universally of /489/ all the things that the subject term is true of.

[9.8.15] This is the meaningful information given by the statement (8.139) 489.1 about 'every'. What it says about 'every' is not that the predicate B is true of each term C such that the subject term is true of all of C, in such a way that if C is a term of which ['good'] holds, but 'good' is not true of all of C, then the predicate [B] is not true of it. Rather it is more general than that. And likewise the statement (8.139) about 'every' doesn't mean that [A] is true of every [term] of which B is true, in such a way that if B was 489.5 true of some C, then A would be true of every C. This would give that the expression 'animal', which is true of every human, would have its meaning [ANIMAL] true of every C whenever some C is a human, so 'animal' would be true of every body. But [being true of every body] can be a narrower condition than being true of some human, as you will have seen in this example. So since the meaning [of 'Every human is an animal'] is not either of these two, how could it mean that [ANIMAL] 'in its entirety' is true of [HUMAN], in such a way that if we say

(8.141)   Pleasure is the good.

and we say   489.10

(8.142)   Every pleasure is good.

[the two sentences share] a single meaning which is entailed by one of the two statements, [namely (8.142)] which speaks of 'every'? So therefore the latter sentence (8.140) in itself gives another piece of information besides (8.139). Thus it is legitimate for the aforementioned syllogism to be composed of sentences like this, and the aforementioned doubt is a non sequitur.

8.7   *Qiyās* ix.9

ix.9 /490/ On circumstances which stand in the way of analysis, to
do with the figure of the syllogism and the forms of the premises,
and which have to be taken into account in analysis because of the
figure and the premise pair and the forms of the premises

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[9.9.1] So let us say something now about the circumstances which hinder the analysis because of the figure of the syllogism and because of the form of the premises, I mean not because of the terms.

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[9.9.2] So we say: It can happen that the given syllogism is compound, so that it has to be analysed first into [simple] syllogisms. Then when one [simple] syllogism is found, that syllogism creates a prejudice that the second syllogism is in the same figure. One should disregard that, since we know that [compound] syllogisms can be compounded from [simple syllogisms in] different figures and moods. Rather one has to consider each [simple] syllogism as it stands, apart from any other.

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[9.9.3] And when syllogisms are composed so as to entail a negative statement, and the predicate is compound, then one can lighten [the syllogism] so that the composition vanishes. Thus, when someone claims that water is a drinkable simple body, then one could deny the phrase as a whole, saying:

(8.143)   [Water] is not a drinkable simple body.

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And it can be denied by denying that it is drunk. So when it is denied that it is drunk, it is not a drinkable simple body. So for there to be a denial that [water] is drinkable, it suffices to give the major term /491/ in the syllogism as just 'drinkable', and then the analysis becomes easier. Then we say

(8.144)   Sea-water is water.

and then instead of saying

(8.145)   Sea-water is not a drinkable simple body.

we say

(8.146)   [Sea-water] is not drinkable.

The fact is, that [single word] will serve your purposes as well as the compound phrase did.

[9.9.4] If the syllogism facing you is a a duplicative syllogism, then its analysis into its figure doesn't analyse it into the recombinant figures. If it is productive as a duplicative syllogism then you will be able to analyse it 491.5 as a duplicative syllogism. The same holds for a syllogism that validly entails an absurdity in the syllogism of absurdity, either in the way commonly accepted, or else as a correct compound containing either a predicative syllogism or a propositional one as we explained, which will be a recombinant syllogism in both cases, and so it can be analysed into the figures.

[9.9.5] The difference between a propositional syllogism which is in the 491.7 duplicative part of the syllogism of absurdity, and a duplicative syllogism which is not in the syllogism of absurdity, is that the propositional syllogism in the absurdity case is independent of a partner to some dialogue making a concession to the other partner, since the truth is already contained in the poles of the contradictory pair. In the other case, one partner 491.10 in the dialogue is required to make a decision about it, and he concedes to the other partner that if the antecedent takes a certain form then a certain consequent follows. Also in every concrete instance of the absurdity syllogism the conclusion is the contradictory negation of the antecedent of the major premise, so there is no explicit redundancy in it. But in the non-absurdity case of course there usually is an explicit redundancy, though sometimes it is not explicit about the duplicated proposition.

[9.9.6] And sometimes the analysing contains something indeterminate, 491.13 where the legitimacy of the syllogism can be shown by analysing it into any one of the three figures, like a syllogism which entails an existentially quantified negative conclusion; or into either the first or the second figure 491.15 — like a syllogism whose conclusion is universally quantified and negative — or into either the first or the third figure — like a syllogism whose conclusion is existentially quantified and affirmative. Sometimes it doesn't analyse into another figure, either because it entails its goal only in one figure — like a syllogism whose conclusion is universally quantified and affirmative — or else because even if it does entail a conclusion, its goal is something diffferent. So it doesn't analyse into that other figure because its terms /492/ don't allow the required conversion to it, as in the fourth mood of the second figure and the fifth mood of the third figure; so you have to take care of the terms and how they overlap. If there is an indeterminacy then [of course] that no longer matters to you after the syllogism has been analysed.

492.3   [9.9.7] And another thing that causes difficulties, along with the question of analysing the syllogism into figures, is the similarity between negative propositions and metathetic propositions. When the premises, or one of them, are metathetic, but you think it is negative, then this is an error.

492.5   The commonest error of this kind is when the conclusion is affirmative and simple with nothing metathetic about it, and the premises include a metathetic proposition, and one thinks of the metathetic proposition as being a denial. For example the minor premise might be metathetic in its predicate, and the major premise metathetic in its subject.

492.7   [9.9.8] An example is when we say:

Every C is a non-B
(8.147)   and whatever is a non-B is an A.
So every C is an A.

[To take either premise as a denial] would be confused and erroneous. So we have to be careful about the behaviour of negative propositions and metathetic propositions. We have to take the metathetic proposition as affirmative, and we have to take the particle of negation [in it] as a part of the term to which it is attached and in particular as a part of the predi-

492.10   cate. You already know the difference between the affirmative metathetic proposition and the negative proposition, and the ways in which they are indistinguishable or distinct. The explanation of this that you had before will suffice for you, and you can do without the elaborations that people introduce into this topic, so as to show the difference between having the negation after 'is' or the copular verb, and having it before 'is' or the copular verb. Some people say that there is no difference between the negation appearing after 'is' or the copular verb, and its appearing after another

492.15   meaning. Thus if the phrase

(8.148)   is not coloured white,

is the contradictory negation of

(8.149)   is coloured white,

then the sentence

(8.150)   It's possible that he is walking.

is the contradictory negation of

(8.151)   It's possible that he is not walking.

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or indeed the phrase

(8.152)   stick that is coloured white,

is the contradictory negation of

(8.153)   stick that is not coloured white.

Then [it follows that] everything is either a white stick or a non-white stick. And the moon will be a non-white stick. This page seems to be garbage, down to 494.10. MAYBE REWORK WITH AM. /493/ And everything will be either a thing which is equivalent to a thing, or else a thing which is not equivalent in the sense that it is different. For example: when we mean by 'not equivalent' the different, or we mean a thing which is broader than it which is assigned to the world (??), so the point will be either equivalent to the line or different.

[9.9.9] They say: When one makes a mistake and takes a metathetic 493.3 proposition as being equivalent to a negative proposition, an impossibility results from it and the mistake is serious. Thus let A be 'created', B 'is-not created', D is non-created, C coloured white, D is-not coloured white, B 493.5 it is not-coloured-white. So B, the thing that is-not coloured white and [a thing that] is-not coloured white is-not coloured white. Because the metathetic proposition is not the negative proposition. And D is the thing which is-not created and not also it is-not created. Because the metathetic proposition is not the negative proposition. And when A is 'created', then it is predicated of C 'coloured white' the broader is predicated, so that every white thing is created, and not every created thing is coloured white. But B is contradictory or it is not created, and D is the contradictory of C, which 493.10 is is-not white, so because A is broader than C, so D is broader than B. And you already know this from what has been repeated to you. And from what has been added to you in the indication of this as a proof, that you know that when it is what A is false of, then C is false of it, so D is true of it. And B was true, and whenever B is true, D is true. But A can be true of what is not C, because it is broader than it, so therefore it is true of some of what is a D, and in this case B is false, and whenever B is true, D is true. 493.15 So therefore D is broader than B. So likewise when D is broader than B, then C will be narrower than A. And on rotation of this proof, let D be the not created, which is equivalent to the contradictory negation of A the created, so if it is equivalent to the contradictory negation, /494/ then it will be with this aforementioned content in the conversion. But B is likewise

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for C, so if D is in effect a contradictory negation of A, it is narrower than B; and it is also narrower than B, since B is equivalent to D insofar as it is not coloured white. And that being so, D is not B, and D also is not A. So it is true of it that it is not A, and it can be true of it also that it is not

494.5 B. And therefore the two extremes have already been false of it. And what has both extremes false of it is in effect the middle. And the middle, it is not in that it is contradictory to one of the two extremes, the first of it in that it is contradictory to the other extreme, but rather it is contradictory to both extremes. So therefore insofar as D is contradictory to A, and B is contradictory to C, B is broader than D and because D is contradictory to B and D contradictory to C, and the contradictory to B is broader than [the contradictory to] C, so D will be broader than D, but it's the same thing,

494.10   and this is absurd.

494.11   [9.9.10] As for us, I say: I really don't understand this discussion at all, and I leave it to someone else to make better sense of it than I can. Because: If you are going to argue that something is an intermediate case because both extremes [A and D] are false of it, then you are saying that there is something that is not an A and not a [D], and that's enough to convince me that A and D were not mutual contradictories [in the first place]. This

494.15   doesn't need rocket science. And in any case this is not like the middle term really. The middle term is what the two extremes are false of /495/ together in cases where they are two different natures, not where they are related by inclusion. A metathetic proposition is not the kind of negative proposition where we say

(8.154)   Human is not animal,

to express that the meaning [ANIMAL] is more inclusive than [HUMAN]. This kind of not predicating animal of human is equivalent to not predicating human of animal. And here in fact the affirmative is not predicated of the metathetic. And as for the negative which is opposite to it, in fact it is

495.5   predicated of the metathetic. And in fact it is distinct from the metathetic proposition in terms of generality. And the intermediate is like the disjoint so it isn't just distinct from the two extremes in that one of the two extremes is broader, but rather in that the extreme is not predicated of [any of] it at all. So therefore the metathetic (why m verb?) has been taken as the middle. But the metathetic term is really just a species and a thing more special than the other extreme. Middles like this don't have to have the same relation to both extremes. Rather, its relation to the first extreme is that the two

495.10   are disjoint, and its relation to the other extreme is that it is [extensionally]

a proper subclass of that extreme. Then in fact the middle, even if the two extremes are denied of it, it doesn't stand in relation to either of the two extremes as its contradictory. It's not the case that if As are not Bs then A is the contradictory of B. And everyone who has an intellect and a level head understands that this relation is not equivalent [to being contradictory]. And it is not necessary, when it is assumed as contradictory from the side, that it becomes contradictory from the other side; but rather that it becomes intermediate. For these reasons it's fair to say that any explanation of all this is going to come from somebody other than me. At any rate there is 495.15 nothing convincing about it in the commentaries. They just charge around at random. /496/ The amount that is known about metathetic and nega- 496.1 tive propositions doesn't need this rocket science for us to set it out fully, so let us confine ourselves to what is needed. That includes explanations and distinctions that we have given. Know that taking the metathetic negation of a proposition (??) in place of its contradictory negation is equivalent to changing a contradictory into a contrary. You already know about this. If the matter is necessary it is not different, and if it is possible it differs and is not legitimate.

Chapter 9

Glossary

Chapter 10

Indices

People and topics
  Arabic words

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