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### Substantive Syllogisms

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## Introduction

Treatment of the syllogism as a basic form of inference is something found to be widespread, even today, in the post twentieth century which saw the entrenchment of classical propositional logic and the appearance of various post-classical logics. A survey of logic texts seems to reveal that the authors have generally followed a standard presentation of the syllogism. Syllogisms are often described as arguments illustrating class relationships and hence it is not uncommon to find that Venn diagramming techniques are discussed in conjunction with them. The examples and exercises connected with the syllogistic form of inference tend to be rather obvious and humdrum ones where certain classes of things are seen as subordinate or superordinate to others and are either included or excluded from them. This practice has a long history; indeed, one can argue that Aristotle himself paved the way for this sort of interpretation. A survey of the classic and quite elegant establishment of the valid moods of the syllogism in *Prior Analytics* I, 4-7 shows him providing "values" for "variables" that seem to follow this sort of inclusion. This interpretation seems to be especially attractive when he is dealing with the so-called cases of "contrasted instances" (Ross 1949, 300 ff.) – such terms as "man" "horse" and "animal"; "horse" "swan" and "white"; and "stones" "animals" and "lines" illustrate how factual relationships of inclusion or exclusion between the groups designated by these terms render invalid certain moods (See Appendix). This method is not restricted only to the first figure, as is clear from its employment beyond the fourth chapter of the *Prior Analytics* (where the first figure is developed).

It is probably quite easy to find any number of teachers who find this approach to the syllogism uninteresting and a large number of students who consider it boring. The syllogistic is thought to be acknowledged by Aristotle as his own innovative discovery,<sup>1</sup> and of such the author could be rightly proud in surveying its intricate and concise development in the section of the *Prior Analytics* already noted. However, such a pride seems even more warranted if the syllogism is taken to be of greater use than simply portraying class relations. Perhaps, to put it in another way, if the philosophical enterprise itself is interested in more than just taxonomy,<sup>2</sup> the syllogism itself will have to do more than simply classify in order to function in this broader enterprise as a respectable philosophical tool. Indeed, if the syllogism has antedated Aristotle as an applied method in philosophy – even if not elaborated in the format he had provided in the *Prior Analytics* – one would suspect that it might be of some significance. Although the vast majority of textbook treatments of the syllogism contain the perfunctory class analysis noted, it is easy to find such books exemplifying other reasoning forms (reductios, conditional arguments, etc.), even if these are also displayed by equally uninteresting and standard (and not infrequently plagiarized?) examples. A notable

exception is R. Purtill who tries to provide substantive philosophical arguments as exemplifications of reasoning forms. How widespread the reception of his text has been is difficult for me to say; one possible drawback to a wide audience is the employment of non-standard symbolic notation. However, he employs a huge number of interesting philosophical arguments drawn from the texts of major philosophers (Descartes, Leibniz, Hume, etc.), arguments on key issues of the respective philosophers or historical periods in which they lived. Nonetheless, the very section of his text dealing with the syllogistic shows the same limited approach and artificiality of examples, e.g., he utilizes some of Lewis Carroll's material (1897 and 1887) that has been the basis of many other texts, directly or indirectly.

The purpose of this paper is to provide an historical view of the employment of syllogistic reasoning that will be both of intrinsic interest in showing how that format has been employed in arguments on important matters and of pedagogic interest in highlighting samples for engaging instances of that format of argument for beginners in logic. In effect, rather than the stereotypical instances of syllogisms, the paper will try to put forward "substantive syllogisms", i.e., syllogisms that deal with matters of some import for different areas of philosophy. The historical survey will also show how the syllogism was able to function creatively to explore exegetically the nature of arguments proposed by philosophers and even creatively provide expansions of those arguments and justifications for some of the claims made within them.

## Historical Survey

Although Aristotle is the figure who has left us a detailed method of deductive reasoning in his syllogistic, one does not thereby want to make the claim that he was the first philosopher to utilize it as an inference form. E. de Strycker, while maintaining that Aristotle's claim in the *Sophistical Refutations* of originality in logic was to be applied to the development of the syllogism (1932),<sup>3</sup> nonetheless examined claims that the initial use of the syllogism can be seen in Plato. The claims he examines are from more modern authors such as Ritter, as well as earlier authors in the Byzantine and Renaissance traditions such as Plethon, Scholarios, Trebizond, and Bessarion. The first and last of these earlier authors claim that Aristotle was not an innovator, while the other two authors championed his originality. Bessarion actually lists a number of syllogisms to be found in Plato (especially the *Parmenides* and the *Timaeus*). De Strycker (1932, 56) concludes his own analysis by asserting that this older tradition maintained that Aristotle had discovered the theory of the syllogism and Plato had employed it – but that these two claims were left without proper elaboration and integration.

He proceeds to examine in more detail how these claims stand in light of the original texts of Plato by examining some examples of syllogistic reasoning in Plato.<sup>4</sup> Consider the first that he offers from *Phaedo* 105e2-7, a passage which reads:

"What do we call something which is not able to receive in itself death?"

"Non-mortal"

"The soul is not able to receive in itself death?"

"No."

"The soul then is a non-mortal thing?"

"A thing non-mortal."

Now there are two things to note with regard to this passage. First, it is in a dialogue format, a format, moreover, which includes statements other than purely declarative ones, i.e., interrogative ones. Second, there are not the quantifiers that seem prerequisite for any syllogism. Now, with regard to the first point, one might say that, as important as the dialogue form is to Plato both in extent (across most of his works) and in intent (his *Seventh Letter's* emphasis on it), one can argue that there is a core of reasoning that can be extracted from the conversation format. Translators have been known to leave out the interlocutors remarks and (rhetorical/leading) questions can be turned into straightforward assertions.<sup>5</sup> Given other minor alterations, one can arrive at the following syllogism:

Anything that is not able to receive into itself death is non-mortal

The soul is not able to receive into itself death.

THEREFORE, the soul is non-mortal.

This now has the appearance of a Barbara syllogism. Another example is cited from *Republic I* (353b2-7) and put forward as:

"Does not everything which has a particular function also have an excellence which is proper to it?"

"Do not eyes, as we say, have their function?"

"Yes."

"Then they also have an excellence which is proper to them."

Eliminating the interrogative negatives here, one ends up with a Barbara syllogism. However, a glance at the context of this passage shows that the major premise is not given as an established universal under which particular cases are to be subsumed for a deductive conclusion, but rather that it is proposed as a universal and the particular cases which Plato goes on to mention, i.e., eyes *and* ears, are meant to establish it. In other words, here there seems to be an induction rather than a deduction at work, albeit when taken in part, as is done above, another Barbara syllogism seems to appear.

Another syllogism noted by de Strycker in Lutoslawski's work (1897, 203) is said to be found in the *Charmides* 161. The passage reads:

"So it seems that modesty both is and is not a good."

"Yes, it does."

"But temperance must be good if it makes those good in whom it is present and makes bad those in whom it is not."

"Why yes, it seems to me to be exactly as you say."

"Then temperance would not be modesty if it really is a good and if modesty is no more good than bad."

Clearly, one must make the same concession as earlier in overlooking the dialogue format. In addition, one must make more radical adjustments to bring its core into syllogistic form, i.e., the conditionals must be eliminated or transformed and the conjunctive contradictory predication must be reduced to a single negative predication.<sup>6</sup> Once these adjustments are made, the syllogism seems to emerge:

Modesty is not good.  
Temperance is good.  
THEREFORE, temperance is not modesty.

This, both Lutoslawski (and DeStrycker, it seems) would maintain is a Cesare, second figure. Of course, the appropriate universal quantifiers need to be inserted.

A further passage is taken from *Philebus* 54c:

"Now pleasure, since it is a process of generation, necessarily comes to be for the sake of some being."

"Of course."

"But that for the sake of which what comes to be for the sake of something comes to be in each case, ought to be put into the class {*moira*} of the things good in themselves, while that comes to be for the sake of something else belongs in another class {*moira*}, my friend."

"Undeniably."

"But if pleasure really is a process of generation, will we be placing it correctly, if we put it in a class different from that of the good?"

"That too is undeniable."

One seems to come to the following syllogism, in de Strycker's words (translated):

That which occurs in light of some thing cannot be entered in the class of the good.  
Pleasure, insofar as it is a becoming, occurs in light of some thing.  
THEREFORE, pleasure cannot be entered into the class of the good.

There must be some adjustments to get this syllogism into the form of the purely assertoric type (elimination of the modal elements) and there must also be the elimination of the metatheoretic description of the relationship ("class of"). Of course, the syllogism is often seen to be a device to explore or express class relationships, and Plato's use of the term "*moira*" seems to imply a conception suggestive of such division. When all this is taken into account, one seems to be confronted with a syllogism that could be a first figure Celarent.

De Strycker raises some other instances but they seem to require even more adaptation, due either to their enthymematic structure or to various complexities of formulation we noted above. As he himself notes, the form is often quite free.<sup>7</sup> There are other questions to be raised with regard to Plato's relationship to the syllogism -- some important ones are mentioned by DeStrycker. Plato seems to have no narrow technical use for the related terms *syllogismos* and *syllogizesthai*. The latter can mean "compare,"

"calculate," as well as "infer"; the former seems not to refer to a particular form of reasoning but rather to the act of inference.<sup>8</sup> Furthermore, Plato either lacks the terms such as *protasis* (premise) and *akra* (extremes) and *horos* (term) or he employs them in a way that display none of the technical implications that we find in the Aristotelian syllogistic.

Now, it is not surprising that Plato would have some forms of reasoning that, albeit not formulated in rigid syllogistic format, can be readily reducible to that format nonetheless. After all, the syllogism is not an "invention" of Aristotle, it is presumably just a discovery; the human mind does naturally – and, as it appears, quite frequently – engage in this form of reasoning. It would be intriguing to explore the dialogues carefully to assemble more examples of syllogisms themselves or of inferences which are more or less readily reducible to syllogisms. This exploration would yield a larger pool for pedagogic purposes.

In turning from Plato to Aristotle, one is clearly confronted with scores of inferences explicitly identified as syllogisms. A mere perusal of the *Prior* and *Posterior Analytics* provides ample support in favor of this claim. Moreover, Aristotle seems to think that all types of reasoning can be reduced to the syllogistic form (*Prior Analytics* I, 41b1-3). However, he employs all sorts of inferences that do not seem -- easily or even at all – reducible to the syllogistic form. Consider, for instance, an argument he uses in the *Physics* 217b29-218a8, which bears on the reality of time. After asking whether time exists or not and what is its nature, he then goes on to say:

"To start, then: the following considerations would make one suspect that it either does not exist at all or barely, and in an obscure way. One part of it has been and is not, while the other is going to be and is not yet. Yet time -- both infinite time and any time you like to take -- is made up of these. One would naturally suppose that what is made up of things which do not exist could have no share in reality.

Further, if a divisible thing is to exist, it is necessary that, when it exists, all or some of its parts must exist. But of time some parts have been, while others have to be, and no part of it is, though it is divisible. For what is 'now' is not a part: a part is a measure of the whole, which must be made up of parts. Time, on the other hand, is not held to be made up of 'nows.'"

Clearly, this argument is not given in a syllogistic format and trying to reformulate it into even a series of syllogisms would prove difficult. The Appendix provides an approximate reformulation in terms of a derivation format familiar from the propositional calculus. This presentation is, again, a rather rough formalization of one of Aristotle's arguments against the existence of Time; Aristotle will go on to consider a number of other arguments such as this, before presenting his own arguments in support of the existence of Time. The whole discussion in the *Physics*, however, employs arguments which are not, for the most part, syllogistic in form and surely not instances of his ideal model of demonstration. That Aristotle does employ syllogistic arguments is not under dispute. However, the numerous formulations of these, as in the *Posterior Analytics* where Aristotle tries to exemplify principles of his "philosophy of science" by means of syllogistic arguments, often have a content that is too abstruse for a pedagogic context. Still, within the Aristotelian tradition, the commitment to the syllogism and the exploration of arguments through the syllogistic form become very important, not only within the commentary tradition but also outside of it. Rather than viewing Aristotle's

application of the syllogism within the confines of his own text, then, the paper will explore the syllogistic exegesis of his text that occurs later. Given the size constraints of this paper, I want to focus on the use that Thomas Aquinas makes of the syllogism to explore and develop Aristotle's ideas about a doctrine found in a familiar passage from the first book of the *Nicomachean Ethics*.

"If, then, there is some end of the things we do, which we desire for its own sake (everything else being desired for the sake of this), and if we do not choose everything for the sake of something else (for at that rate the process would go on to infinity, so that our desire would be empty and vain), clearly this must be the good and the chief good. Will not the knowledge of it, then, have a great influence on life? Shall we not, like archers who have a mark to aim at, be more likely to hit upon what is right? If so, we must try, in outline at least, to determine what it is, and of which of the sciences or capacities it is the object. It would seem to belong to the most authoritative art and that which is most truly the master art. And politics appears to be of this nature; for it is this that ordains which of the sciences should be studied in a state, and which each class of citizens should learn and up to what point they should learn them; and we see even the most highly esteemed of capacities to fall under this, e.g. strategy, economics, rhetoric; now, since politics uses the rest of the sciences, and since, again, it legislates as to what we are to do and what we are to abstain from, the end of this science must include those of the others, so that this end must be the good for man. For even if the end is the same for a single man and for a state, that of the state seems at all events something greater and more complete whether to attain or to preserve; though it is worth while to attain the end merely for one man, it is finer and more godlike to attain it for a nation or for city-states. These, then, are the ends at which our inquiry aims, since it is political science, in one sense of that term" EN, I, 1094a18-1094b11.

Now, those familiar with Aquinas' commentaries recognize that he divides the text of Aristotle into *lectiones* (readings) upon which he then performs an exegesis. These *lectiones* vary in length. The selection here is the second *lectio* in his commentary and is highly illustrative of the impact of the syllogism in his commentary style. The first thing that Aquinas does is to disengage the primary propositions that are present in this section or pericope of text. They are, he says, three (which I will list as A1, A2, A3):

- A1). There is a highest end in human affairs;
- A2). There is a need to have knowledge of it;
- A3). Civic science is the knowledge of the highest end.

Syllogism (leading to proof of A1):

*Major:* Whatever end is sought for itself and not for another is the highest end.

*Minor:* In human affairs there is need for an end that is sought for itself and not for another.

*Conclusion:* In human affairs there is some good and highest end. (A1)

That Aquinas actually intends this as a syllogistic structure seems clear from the way he lays out the propositions, albeit the prepositional phrase "*in rebus humanis*" (in human affairs) would need some transformation so that the relevant propositions in which it occurs could be of standard form. Another indication of this layout is that Aquinas notes that Aristotle proves the minor by a reasoning *reductio ad impossibile* ("*minorem probat ratione ducente ad impossibile*"). The outline for this, in effect, is as follows:

Proof of Minor:

One end is desired for another (end).

This latter end is either:

(a) Not desired for another

(b) Desired for another.

If (a), the proof is established.

If (b), there would be an infinite regress in the realm of ends – but this is impossible.

Therefore, (a).

This argument is not syllogistic. Aquinas seems to signal this even before he provides it; he makes no attempt to capture it in three sentences as he had the previous argument. However, this *reductio* layout has made clear to him that another proof is required, namely, one to establish the impossibility of regress in the realm of ends. This proof is achieved by another *reductio* proof ("*probatur etiam ratione quae est ducens ad impossibile*"), although the passive verb leaves it unclear whether he wishes to attribute it to Aristotle:

Proof to establish that (b) is impossible and thereby the danger of regress is overcome:

If there is an infinite regress in the desiring of ends, then man will never attain the ends desired.

Something which is not able to be attained is desired in vain.

Therefore, the end (of the things desired) would be vain.

But the desire is natural.

The good is what is naturally desired.

The natural desired object would be empty.

But the natural desired object is an inherent inclination (from the Prime Mover).

What is inherent cannot be frustrated.

Therefore, infinite regress is impossible.

I have made no attempt here to put this forward in syllogistic format even as regards the sub-inferences included within it. It might be possible to do so in part but since Aquinas seems to make no effort to do so, it hardly seems worth the effort to do it here. Furthermore, many of the premises need support themselves or supplementation by other premises. After all this, Aquinas with a concluding sentence seems to be satisfied he has established A1.<sup>9</sup>



Aquinas now turns his attention to establishing the second main thesis in this part of the *lectio*. The argument (leading to proof of A2) appears to be as follows:

*Major:* Man cannot follow something that is directed to an end, unless he knows the end set for that thing.

*Minor:* Man's life is directed to the ultimate end of human life.

(For life to be lived, the rationale (*ratio*) of the means of living is based on the end of life.)

{The universe is an ordered, rational structure – the things directed to an end derive their meaning from it.}

*Conclusion:* There is need for man to have knowledge of the highest end. (A2)

Now, Aquinas gives no indicator, as he did in the previous section, that the argument was to be of a syllogistic format, and the conditional element in the first premise would need some revision if it were to be put into an assertoric format. He does explicitly note, however, that it is a definite argument, i.e., *tali ratione*. The bracketed sentences seem to be presupposed as philosophical truths needed for the argument to go through, and it seems that one could easily object that Aquinas should have situated them in the argument in more than just a passing way.

Finally there is an argument which leads to the proof of A3:

*Major:* The most principle and architectonic of the sciences deals with the highest end.

*Minor:* Civic science is the most principle (P1) \* and architectonic (P2) of the sciences.

*Conclusion:* Therefore, civic science deals with the consideration of the highest end. (A3)

{\*Most principal in the type of active sciences (of human affairs).}

Aquinas notes that Aristotle offers a reasoning (*rationem*) for the proposition in question, and although he does not use the word syllogism, or even make reference to the major or minor premises, as he did previously, he nonetheless gives us an argument of *three* statements, with the *two* inferential particles 'but' and 'therefore' preceding the second and third propositions respectively, *each* of which is an assertoric statement of the "S is P" format. Aquinas offers a reason for the major and then proceeds to give more detailed support for the minor premise.

He gives two expositions – 'proofs' would be too strong an expression -- of the minor premise. The first concerns that politics is the (P2) most architectonic of the sciences and he does this in two ways. He argues that it is in such a position that:

- a). it instructs the lower sciences/arts, and
- b). it uses them for its own end.

This architectonic role applies to both (i) speculative and (ii) practical arts. With regard to the practical arts it supervises not only the activation or non-activation of the art's application but also how it is applied. *Vis-à-vis* (i) it is supervisory only regarding the activation/non-activation, e.g., that certain people learn or teach geometry and others do not.

The second 'proof', that political science is the (P1) most principle of the sciences, is presented here syllogistically, although Aquinas is much more prolix in elaborating it:

Whatever extends to a greater number is prior.  
Civic science extends to a greater number of people (individual and state).  
Therefore, civic science is "most prior."

By referring back to the original passage, one begins to see the argumentative order that Aquinas sees in it (a Barbara syllogism). Whether this order is seen as "abstracted" from the text or as "induced" upon it, the result is still impressive and creative. Although the syllogism is not the only method of proof used, it still seems to be a dominating influence in the very formation of the commentary.

It is important to note here that Aquinas is not the only commentator who proceeds this way in the medieval period. Indeed, he is probably influenced in his approach by his own teacher, Albert the Great. A quick glimpse in the appendix reveals that Albert has any number of expository syllogisms laid out in rapid succession. These syllogisms are not all in strict format; many are enthymematic. However, their structure is unmistakable and they again testify to the importance of this type of reasoning in the period. This approach is obvious in the treatise and manual tradition in the later medieval, renaissance, and modern periods; this last is noted in the Appendix as well. It is also employed in works that might, from their title, appear to have little to do with scholarly subjects. Consider the excerpt in the Appendix from the work *Malleus malificarum* (Kramer and Sprenger 1928). Here the exposition is developed with the aid of syllogistic arguments; the subject matter seems truly bizarre.

However, the syllogistic approach is not entirely absent from properly modern thinkers. Leibniz is a thinker who employs syllogistic reasoning in a proof that bears on a topic of considerable importance to his philosophy – and one that was important to Descartes as well<sup>10</sup> – the immortality of the soul. As Leibniz notes, the demonstration is a sorites, but one must be quick to note that there are explanatory or justificatory phrases sprinkled through much of it and he does not indicate what syllogistic moods he is using. However, from approximately line 26 onwards there is a relatively clear structuring of the inferential activity by means of subject and predicate terms including the use of quantifiers. In lines 32 and 33 he employs obversion. The conclusion is ultimately established by means of the connection of the non-motive action of mind with incorruptibility. While the conceptual linkage of the ideas needed for this conclusion extend through the Middle Ages to Augustine and ultimately Plato, Leibniz' formulation of these concepts into a proof is concise.

## Conclusion

This brief historical overview should provide some insight into the role the syllogism has played in the history of philosophy. Rather than being an exhaustive study, this discussion is meant to be more of an invitation to make the study of the syllogism a more interesting and attractive pedagogic enterprise. Nonetheless, the objection might be

raised that even this aim is difficult to see realized. Specifically, there are three problems that seem to emerge. First, there seems to be no way for the students (learners) to get a comprehensive grasp of the valid/invalid forms of the *syllogisms*. The usual textbook methods, albeit different from Aristotle's own method, have the advantage of conveying to the student, either via a set of rules or via a diagramming procedure (e.g., Venn), a means to determine the validity of any *syllogistic form*. Second, the above examples illustrate only a mere fraction of the various types of syllogism. Those in the first figure seem to be the ones which occur with the greatest frequency; the other figures seem to be less often used in the actual philosophical texts. Third, the surface analysis seems to indicate that class inclusion is occurring even in the examples cited. It becomes questionable, then, whether a consideration of the instances above makes any advance over the standard textbook approach.

In brief response to these objections I would say, first of all, that the traditional rules, Venn diagramming, or even Aristotle's own method for the determination of the valid moods of the syllogism need not – indeed should not – be ignored. Actually, an understanding of all three will help students understand the inner workings of syllogistic reasoning. Regarding the second objection, I am more than willing to admit that there is a first figure dominance in the group of examples raised. One should note, however, that even Aristotle, in his *Posterior Analytics*, tends to use examples which fall under the first figure format. It is probably not without reason that Aristotle thought that the first figure is that to which moods in the other figures could be reduced and in which one finds perfect syllogisms. Of course, one hopes that further searches for syllogisms will begin to yield examples for the various moods in other figures. With respect to the third objection, it must be said that although class inclusion can play a role (the *Philebus* syllogism seems to show this), it is not always the case that one class is subordinated to another in a syllogism. Moreover, it hardly seems that, in many of the cases examined, the authors are even thinking in terms of class relationships.

It seems mistaken, on the one hand, to think that all the complex reasonings we employ can be expressed in a syllogistic format. It seems equally mistaken, on the other hand, to relegate the role of the syllogism to that of expressing tedious class inclusions or taxonomies. Indeed, one must remember that in inference one is ultimately searching for a reason why a predicate is attributed to a subject – i.e., one is searching for a middle term. The syllogism is the form of reasoning that expresses in a schematic way this most basic activity of mind.

Appendix

Contrasted Instances in the *Prior Analytics*:

25b27	$\frac{B \ a \ A}{C \ a \ B}$ C a A	BARBARA	$\frac{B \ e \ A}{C \ a \ B}$ C e A	CELARENT
26a7	$\frac{B \ a \ A}{C \ e \ B}$ C a A	A = Animal B = man C = horse	$\frac{B \ a \ A}{C \ e \ B}$ C e A	A = Animal B = man C = stone
26a10	$\frac{B \ e \ A}{C \ e \ B}$ C a A	A = science B = line C = medicine	$\frac{B \ e \ A}{C \ e \ B}$ C e A	A = science B = line C = unit
26a23	$\frac{B \ a \ A}{C \ i \ B}$ C i A	DARII	$\frac{B \ e \ A}{C \ i \ B}$ C o A	FERIO
26a32	$\frac{B \ i \ A}{C \ a \ B}$ C a A	A = good B = conditon C = prudence	$\frac{B \ i \ A}{C \ a \ B}$ C e A	A = good B = conditon C = ignorance
26a37	$\frac{B \ o \ A}{C \ e \ B}$ C a A	A = white B = horse C = swan	$\frac{B \ o \ A}{C \ e \ B}$ C e A	A = white B = horse C = crow
26b7	$\frac{B \ a \ A}{C \ o \ B}$ C a/e A	A = Animal B = man C = white (swan/snow)	$\frac{B \ e \ A}{C \ o \ B}$ C e/a A	A = inanimate B = man C = white (swan/snow)

Argument on Time (*Physics*):

1). Time exists.	AR
2). If anything exists, then it is either divisible or indivisible.	AS
3). If Time exists, then it is either divisible or indivisible.	UI, 2
4). Time is divisible or indivisible.	MP, 1,3
5). Time is not indivisible.	218a1-2
6). Time is divisible.	DE, 4,5
7). If anything is divisible, its parts must exist.	218a3-5
8). If Time is divisible, its parts must exist.	UI, 7
9). Parts of time (past, present, future) exist.	MP, 6,8
10). If something is a part (of a thing), it is a measure of the whole.	218a6-7
11). The now is not a measure of the whole.	218a6-7
12). Neither the past nor the future exist.	218a5
13). The now is not a part (of time).	MT, 10, 11
13). Parts of Time do not exist.	CI, 12, 13
14) Time is not divisible.	MT, 8, 13

15). Time is not indivisible.	Reit, 5
16). Time is neither divisible nor indivisible.	DI, 14, 15
17). Time does not exist.	MT, 3, 16

The abbreviations are the following: 'AR' for 'assumption for reductio'; 'AS' for 'assumption'; 'UI' for 'universal instantiation'; 'DE' for 'disjunction elimination'; 'DI' for 'disjunction introduction'; 'CI' for 'conjunction introduction'; 'MP' for 'modus ponens'; 'MT' for 'modus tollens'; and 'reit.' for reiteration. Numbers followed by letters refer to the Bekker text location of Aristotle.

*Opera Omnia* (Albert the Great (Westfallen, 1968-72), ed. W. Kübel), vol xiv, Pars I, 87:

"Every virtue is in the will, as said in the third book (114b22). But wisdom and intelligence are not in the will. Therefore, they are not virtues." This gives a Camestres in the second figure.

Every virtue is in the will.  
Wisdom and intelligence are not in the will.  
 Wisdom and intelligence are not virtues.

"Moreover, he himself says that every "virtue is operative of the best" (1104b28). But wisdom is not operative. Therefore, etc." This gives a Cesare in the second figure.

Every virtue is operative of the best.  
Wisdom is not operative.  
 Wisdom is not a virtue.

"Furthermore, Augustine says, that virtue is 'that which no one uses badly'. But many evil people use wisdom. Therefore, etc." With some alteration this becomes a Cesare in the second figure.

No Virtue is used by anyone badly.  
Wisdom is used by evil people (badly).  
 Wisdom is not virtue.

"Moreover, he will say below, that virtue is that by which one is made good and his work is rendered good. But by wisdom no one is made good. Therefore, etc." With some alteration this becomes a Cesare in the second figure.

Virtue is that by which one is made good.  
Wisdom is not that by which one is made good.  
 Wisdom is not virtue.

*Elementa Philosophiae* (Freiburg: Herder, 1961) by Joseph Gredt:

The text is developed along the lines of a series of thesis which are defended by individual arguments (often syllogistic in form). The major and minor premises are often supported separate arguments (though not always or even often in syllogistic form). Consider the argument against monism (vol 1, 222):

Men are substances that are numerically distinct among themselves.

Men are substances in the physical world.

Some substances in the physical world are numerically distinct among themselves.

Presumably the premises are universal; the figure is the third; the mood a Darapti.

Sometimes the predicates are metalogical as in the case of a criticism of Leibniz on space (Vol. 1, p. 230):

A doctrine which posits space as real without any continuous extension of bodies is false.

Dynamism posits space as real without any continuous extension of bodies.

Dynamism is false.

*Malleus Malificarum* (58)

"And again, whoever can create a natural shape can also take it away. But devils have created many natural shapes, as is clear from Pharaoh's magicians, who with the help of devils made frogs and serpents. Also S. Augustine, in Book LXXXIII, says that those things which are visibly done by the lower powers of the air cannot be considered to be mere illusions; but even men are able, by some skilful incision, to remove the male organ; therefore, devils can do invisibly what others do visibly."

The syllogism would seem to be a first figure Barbara:

Whoever can create a shape is one capable to take a shape away.

Devils are able to create a shape

Therefore, devils can take a shape away.

"Again, that which happens of necessity has no need of provident permission or prudence. This is clearly shown in Aristotle's Ethics, Book II: Prudence is a right reasoning concerning things which happen and are subject to counsel and choice. But several effects of witchcraft happen of necessity; as when for some reason, or owing to the influence of the stars, diseases come, or any other things which we judge to be witchcraft. Therefore, they are not always subject to Divine permission.

The syllogism would seem to be a first figure Ferio:

Nothing which happens of necessity is in need of provident (Divine) permission.

Some effects of witchcraft happen of necessity.

Therefore, some effects of witchcraft are not subject to Divine permission.

Leibniz: (Loemker ed., 113)

*The Immortality of the Human Mind, Demonstrated in a Continuous Sorites*

The human mind is a being, one of whose actions is thinking.

If one of the actions of a being is thinking, one of its actions is immediately perceptible, without supposing parts in it.

For thought is (1) a thing that is immediately perceptible, mind being immediate to itself when it perceives itself thinking. (2) Thought is a perceptible thing without awareness of parts. This is clear from experience. For thought is that 'something, I know not what' which we perceive when we perceive what we think. But when, for example, we perceive that we have thought of Titius, we not only perceive that we have the image of Titius in our mind, for this has parts, of course; such an image is not enough for thinking.

For we have images in the mind even when we do not think of them, but we perceive, besides, that we have been aware of this image of Titius, and in this awareness of our images itself we find no parts.

Assume a being performing a certain action which is immediately perceptible, without a perception of its parts. Then this certain action is a thing without parts;

For a quality immediately perceived in a thing actually belongs to it, since: The cause of error is the medium, for if an object of perception were the cause of error, it would always be perceived falsely; if the subject were the cause, it would always perceive falsely.

If something has for one of its constituents a thing without parts, then one of its actions must be other than motion;

For all motion has parts, by Aristotle's demonstration and common agreement.

A being whose action is not motion is not a body;

For all bodily action is motion, since every action of a thing is a variation of its essence, and the essence of a body is being in space.

But motion is a variation of existence in space.

Therefore every action of a body is motion.

Whatever is not a body is not in space; for to be in space is the definition of a body.

Whatever is not in space is not movable, for motion is change of space.

Whatever is immovable is indissoluble, for dissolution is the motion of a part.

Everything indissoluble is incorruptible, for corruption is internal dissolution.

Everything incorruptible is immortal, for death is corruption of the living, or dissolution of its fabric, through which self-moving things obviously move themselves.

Therefore the human mind is immortal. Q.E.D.

Notes

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<sup>1</sup>This rests mainly on *Sophistical Refutations* 184b2: *peri de tou syllogizesthai pantelos ouden eichomen proteron allo legein*. "whereas regarding reasoning we had absolutely no earlier work to quote" (Loeb trans.). Although *syllogizesthai* might be taken to refer to the syllogistic as such, the term also has an amplitude of meaning that would allow it to include other aspects of Aristotle's work, including the *Topics* and the *Sophistical Refutations* themselves. See Dorion (1995, 418) for a discussion of the interpretations. The lines earlier (circa 183b35) where Aristotle speaks of the current enterprise (*tautes tes pragmateias*) lead one to believe that he is referring to dialectic and not syllogistic as such.

<sup>2</sup> Many philosophers consider philosophy to have more complex role than simply providing taxonomies of what is real, although the early Academy is sometimes seen as focused on this. See Lang (1965, 62-67).

<sup>3</sup> "Aristote fait remarquer qu'avant lui on n'avait donné aucun exposé systématique du syllogisme"; (42) and "sa prétention à la priorité absolue dans la découverte des règles du syllogisme en ressort d'autant plus vivement." (43).

<sup>4</sup> In selecting these he is utilizing the work of Edouard des Places who did a study of the inferential particles in Plato; this serves as a base for providing the instances that he uses.

<sup>5</sup> Cornford (1939, 109) is notorious for this in his translation of the *Parmenides*.

<sup>6</sup> That is, "Modesty both is and is not a good" must be reduced to "Modesty is not a good." This occurs presumably is legitimized via use of the law: "If (p and not-p), then not-p" where p is, "Modesty is a good."

<sup>7</sup> "On remarquera une fois de plus combine la forme syllogistique est libre." 222.

<sup>8</sup> "Quant à *syllogismos* (Cratyle 412a5; Théétète 186d3), il semble signifier non le raisonnement, mais l'acte de l'intelligence qui réunit...."

<sup>9</sup> "Et ita necesse est esse aliquem optimum finem rerum humanarum."

<sup>10</sup> In his Preface to the *Meditations* Descartes offers this as one of the chief reasons that motivated his work.



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