

## Laval théologique et philosophique



### The *Posterior Analytics* and the *Topics*

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Volume 25, Number 1, 1969

URI: <https://id.erudit.org/iderudit/1020137ar>

DOI: <https://doi.org/10.7202/1020137ar>

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#### Publisher(s)

Laval théologique et philosophique, Université Laval

#### ISSN

0023-9054 (print)

1703-8804 (digital)

[Explore this journal](#)

#### Cite this article

VanderWeel, R. L. (1969). The *Posterior Analytics* and the *Topics*. *Laval théologique et philosophique*, 25(1), 130–141. <https://doi.org/10.7202/1020137ar>

## The *Posterior Analytics* and the *Topics*

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Some popular presentations of the thought of Aristotle seem to promote what appears to us to be misleading regarding the relation of the *Posterior Analytics* to the *Topics*. Ross, for example, finds that the *Analytics* in general is of much more interest to us today than the *Topics* with its laborious exploration of the τόποι, the pigeon-holes from which dialectical reasoning is to draw its arguments."<sup>1</sup> The discussion in the *Topics* really belongs, he writes, to a by-gone way of thinking, the product of a last-ditch attempt of the Greek sophistical movement towards a general culture. In fact, Aristotle himself seems to have recognized this, for "he has himself shown a better way, the way of science; it is his own *Analytics* that has made his *Topics* out of date."<sup>2</sup> Mure seems to agree with Ross on this last point. The *Posterior Analytics*, or at least its first book, deals with "scientific demonstration."<sup>3</sup> The *Topics*, which discusses dialectic, is one of Aristotle's early works, wherein he attempts to fashion an instrument of general culture. But later in his life Aristotle lost interest in this project, and the *Analytics*, a work to aid the specialist, supersedes in importance "this propaedeutic for the dilettante."<sup>4</sup>

Here it will be argued that the *Posterior Analytics* is not meant to replace the *Topics* at all, but rather that each treatise in fact is meant to serve a special need in the direction of reasoning. Rather than being contrary to one another, the treatises are complementary. Our argument will be based largely on the interpretations of Albertus Magnus and Thomas Aquinas.

### "*Pars Iudicativa*" and "*Pars Inventiva*"

The question of the subject of the *Posterior Analytics* and its place within the *Organon* of Aristotle is explicitly treated by Thomas Aquinas in his introduction to the treatise.<sup>5</sup> Before stating the subject and the aim of the tract he is about to interpret Aquinas first speaks of the necessity of the art of logic as a whole, the nature of this disci-

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1. David Ross, *Aristotle* (5th ed.; London: Methuen, 1964), p.59.

2. *Ibid.*

3. G. R. G. Mure, *Aristotle* (New York: Oxford University Press, 1964), p.208.

4. *Ibid.*, p.217.

5. St. THOMAS, *In Libros Posteriorum Analyticorum Expositio*, ed. R. Spiazzi (Turin: Marietti, 1955), prooemium.

pline and its divisions, in order, it seems, to place this treatise in its proper perspective.

An art directing the acts of reason is both possible for man to devise, and even necessary. Because of his ability to reflect, man has been able to develop the many mechanical and fine arts according to which he is made fit to act in a reasonable and determinate way for the ends which he sets for himself. It is in fact man's ability to act in this way that sets him apart from other kinds of life. "Mankind lives by art and reasonings." But reason can reflect not only on the work of hand and imagination but also on itself and its own actions in such a way that it is possible for man to discover an art having directive guidance for the acts of reason itself. This possibility becomes a necessity if man wishes to proceed in his acts of intellectual knowledge in an orderly way, with ease, and without error.<sup>1</sup> Albertus Magnus, for his part, minces few words on this necessity when he writes that such an art is not only useful for the philosophical sciences, but also quite necessary. Those who appear to know a great deal, but are at the same time ignorant of the art of reasoning, he says, do not really know, because they do not know how something can be said to be known, nor how something is to be proved or disproved.<sup>2</sup>

This directing art is named "logic" or "rational science" not only because it is in accordance with reason — any art is "rational" in that sense — but principally because it is concerned with the activity of reason as its proper matter of consideration.<sup>3</sup> If this logical art is so important for the sciences, then, in spite of the difficulties its learning may involve, it should be studied beforehand.<sup>4</sup> Logic alone can teach the mode of procedure common to all the sciences, a mode which is nothing other than this, that from what is known the mind proceeds to the knowledge of what is unknown. Such a "movement" seems to be proper to reason as such.<sup>5</sup>

If the activity of reason in general constitutes the subject matter of logic, one is enabled to make divisions within the science if diverse acts of reason with their peculiar characteristics can be found. Aquinas

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1. *Ibid.*, n.1.

2. "Non ergo tantum utilis est (logica) et adminiculans ad omnes scientias, sed etiam necessaria. Propter quod nescientes logicam, etiam id quod scire videntur, nesciunt se scire, quia nesciunt qualiter unumquodque scire oportet et qualiter probandum vel improbandum est." ST. ALBERT, *De Universalibus*, Tractatus Primus "De Antecedentibus ad Logicam," ed. J. Blarer, *Teoresi: Rivista di Cultura Filosofica*, IX (1954), c.3.

3. ST. THOMAS, *loc. cit.*, n.2.

4. Cf. ST. THOMAS, *Expositio super Librum Boethii de Trinitate*, ed. B. Decker (Leiden: E. J. Brill, 1959), q. 6, a. 1, ad secundam quaestionem, ad 3.

5. "Hic autem modus, quamvis communis sit per hoc quod ponitur in qualibet scientia, tamen secundum se consideratus et non immixtus scientiis, est quoddam per se distinctum ab omnibus aliis. Et hoc modo consideratus hic modus potest esse subiectum scientiae." ST. ALBERT, *loc. cit.*, c.1.

finds that there are three diverse acts of reason, the first two being of reason according as it is a kind of *intellectus* or understanding. There is, first, the act which may be called the understanding of indivisibles or of the incomplex, according to which one conceives the "what" of a thing. A second operation of the mind is that of composition or division, by means of which the true or the false is expressed. A third act of reason, and which is proper to reason as such, is the discourse or "movement" from one thing to another, that is, the process in which one comes to the knowledge of the unknown through what is already known.<sup>1</sup> For Aquinas, the doctrine found in the Aristotelian *Categories* is to be placed in the logic of the first act of reason while the *Peri Hermeneias* serves in the logic of the second act. The other logical works of Aristotle are situated by Thomas in the logic of the third act of reason.

These three acts of the mind, it should be noted, are ordered among themselves. The first is ordered to the second, because there can be composition or division only of what has been apprehended simply. The second is in turn ordered to the third act, because it is necessary that reason proceed to gather the truth of what is unknown from some truth already known. This will mean that the treatise on the *Categories* is ordered to that of the *Peri Hermeneias*, which is, in its turn, ordered to the other treatises in Aristotelian logic.<sup>2</sup>

Within the act of reason properly so-called, a further division can be made inasmuch as one can see that there are three processes of reasoning that are quite distinct. To make this clear, Aquinas has recourse to a similitude. Reason works in a way that is comparable to the way nature does. In the activities of nature, a threefold diversity can be distinguished. In some cases nature acts infallibly, accomplishing what it intends; in other cases it acts in a rather steady manner, but in such a way that it is possible for it to miss its mark. Within these instances, we can distinguish further the natural act which usually succeeds (as when nature produces a normal baby), from that act in

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1. "Sunt autem rationis tres actus: quorum primi duo sunt rationis, secundum quod est intellectus quidam. Una enim actio intellectus est intelligentia indivisibilium sive incomplexorum, secundum quam concipit quid est res. Et haec operatio a quibusdam dicitur informatio intellectus sive imaginatio per intellectum . . . Secunda vero operatio intellectus est compositio vel divisio intellectus, in qua est iam verum vel falsum . . . Tertius vero actus rationis est secundum id quod est proprium rationis, scilicet discurre ab uno in aliud, ut per id quod est notum deveniat in cognitionem ignoti." ST. THOMAS, *In Post. Anal.*, prooem., n.4.

2. "Harum autem operationum prima ordinatur ad secundam: quia non potest esse compositio et divisio, nisi simplicium apprehensorum. Secunda vero ordinatur ad tertiam: quia videlicet oportet quod ex aliquo vero cognito, cui intellectus assentiat, procedatur ad certitudinem accipiendam de aliquibus ignotis . . . Et ideo secundum praedictum ordinem trium operationum, liber *Praedicamentorum* ordinatur ad librum *Perihermeneias*, qui ordinatur ad librum *Priorum* et sequentes." ST. THOMAS, *In Librum Peri Hermeneias Expositio*, ed. R. Spiazzi (Turin: Marietti, 1955), prooemium, nn.1-2.

which nature "makes a mistake" (as when a deformed child is born). The deformity in this instance is to be blamed on some defect on the part of the cause. Reason "imitates" these workings of nature. There is, thus, a process of reason which involves the necessity of the consequent in such a manner that error is impossible, and in which scientific certitude is acquired. There is another process in which what is true is usually but not necessarily concluded. And thirdly, there is a process of reasoning in which not the true but the false is concluded, which fault is caused by the reasoning process itself.<sup>1</sup> In the same vein, Albertus argues that the form of reasoning in regard to mode and figure may be found in three "matters": necessary, non-necessary or probable, and apparent only.<sup>2</sup> If this is the case it is then possible to assert that there are three and only three possible sorts of rational discourse, rational, that is, according to what is proper to reason as such. Because of this, the logic of the third operation can be divided into three parts, each part concerned with one of the particular processes.

That part of logic which serves the first process of reason can be named *Pars Iudicativa* for the simple reason that judgment is involved in scientific certitude. And because judgment with certitude concerning effects cannot be made except by analyzing or resolving them into their principles, this part of logic takes the name *Analytics* or *pars resolutiva*. What is known with certitude may be resolved into the mode and figure of syllogism, and into its material or real principles. The *Prior Analytics* of Aristotle, concerned with syllogism *simpliciter*, is ordered to the formal resolution of what is known scientifically, while the *Posterior Analytics*, whose subject is the demonstrative or "science-producing" syllogism, is ordered to the material resolution of the act of science.<sup>3</sup>

Thus stated rather briefly, the subject and the aim of the treatise of the *Posterior Analytics*. Because the book is a logical work, it will, like all of logic, teach the common or general mode of proceeding. Logic, in fact, can do no more than that, for it cannot establish the proper ways of arguing in each of the sciences, which task is the function of the scientist himself to consider.<sup>4</sup> The *Posterior Analytics*, then,

1. "Est enim aliquis rationis processus necessitatem inducens, in quo non est possibile esse veritatis defectum; et per huiusmodi rationis processum scientiae certitudo acquiritur. Est autem alius rationis processus, in quo ut in pluribus verum concluditur, non tamen necessitatem habens. Tertius vero rationis processus est, in quo ratio a vero deficit propter alicuius principii defectum; quod in ratiocinando erat observandum." ST. THOMAS, *In In Post. Anal.*, prooem., n.5.

2. ST. ALBERT, *In Duos Elenchorum*, I, Tr. I, c.1.

3. "Certitudo autem iudicii, quae per resolutionem habetur, est, vel ex ipsa forma syllogismi tantum, et ad hoc ordinatur liber *Priorum Analyticorum*, qui est de syllogismo simpliciter; vel etiam cum hoc ex materia, quia sumuntur propositiones per se et necessariae, et ad hoc ordinatur liber *Posteriorum Analyticorum*, qui est de syllogismo demonstrativo." ST. THOMAS, *In Post. Anal.*, proom., n.6. Cf. ST. ALBERT, *De Univ.*, Tr. I, c.3.

4. Cf. ST. THOMAS, *In II Metaph.*, lect.5, n.335.

teaches the common mode and art of demonstrating in any particular demonstrative science. Its use is therefore a universal one: it provides the demonstrator in whatever subject he may be involved with his proper instruments.<sup>1</sup>

The second process of reasoning listed also calls for artful direction. Reason can form an argument in which there is no necessity of the consequent involved, but only inferential necessity. Such a rational process will be served by that section of logic which the medieval commentators called *Pars Inventiva*, because *inventio* or discovery does not necessitate certainty just by itself. A further act of judgment is required to attain this. Now just as among those natural things which usually accomplish their goal different grades or degrees of attainment can be distinguished, so it is in this process of reason: different levels are found as one approaches more or less the perfect certitude of science. Thomas lists three grades in descending order. *Belief* or *opinion* may be engendered by an argument proceeding from probable propositions. Or, again, a kind of *suspicion* may result. And finally, there may be only an *existimatio* of the truth, resulting from the representation of something as desirable or undesirable.<sup>2</sup> The three movements of reason which result in these states of mind are served by three treatises of Aristotle, all of which pertain to rational science understood generally.<sup>3</sup> The treatise on the *Topics*, whose subject is the dialectical syllogism, which proceeds from probable principles, serves the first grade of *inventio*; the *Rhetoric*, the second; and the *Poetics*, the third, since it is the poet's function to induce men to virtue by means of fitting representations.

The third process of reasoning, this time in only apparent matter, is studied in the *Pars Sophistica* of logic, which is Aristotle's concern in his *Sophistical Refutations*.<sup>4</sup>

Thus is a place assigned to the *Posterior Analytics* in the ensemble of Aristotle's logical writings. Albert and Thomas find no difficulty in giving room in logic to both treatises: the *Posterior Analytics*,

1. ST. ALBERT, *In Duos Posteriorum Analyticorum*, I, Tr. I, c.1.

2. "Per huiusmodi enim processum, quandoque quidem, etsi non fiat scientia, fit tamen fides vel opinio propter probabilitatem propositionum, ex quibus proceditur: quia ratio totaliter declinat in unam partem contradictionis, licet cum formidine alterius . . . Quandoque vero, non fit complete fides vel opinio, sed suspicio quaedam, quia non totaliter declinat ad unam partem contradictionis, licet magis inclinet in hanc quam in illam . . . Quandoque vero sola existimatio declinat in aliquam partem contradictionis propter aliquam repraesentationem ad modum quo fit homo abominatio alicuius cibi, si repraesentetur ei sub similitudine alicuius abominabilis." ST. THOMAS, *In Post. Anal.*, prooem., n.6.

3. "Omnia autem haec ad Rationalem Philosophiam pertinent: inducere enim ex uno in aliud rationis est." *Ibid.* St. Thomas seems to make this comment to explain the presence of the *Rhetoric* and the *Poetics* in his schema, for they are not usually included in the *Organon*. Cf. ST. ALBERT, *De Univ.*, Tr. I, c.2.

4. ST. THOMAS, *In Post. Anal.*, prooem., n.6.



placed in the "judicative part" of logic, has as its subject the demonstrative syllogism; the *Topics*, in the "inventive part," treats of the dialectical syllogism. The treatises are distinct one from the other because of the subjects they deal with, and because each has its proper end: the *Posterior Analytics* is meant to direct the act of judgment of the truth, an act which is distinct from the inquiry and discovery of the truth, which is directed by the *Topics*.

Perhaps, though, the point has been reached too quickly. Is it perfectly clear that the act of judging and the act of discovery are distinct acts? An appeal to ordinary experience certainly can be made. Thus we hold many things as true even if we cannot give what may be called a real reason why we think that way. We find ourselves unable to give the exact "because" for our views, but nevertheless we can give at least some kind of reason why we hold that such and such is the case. In other words, we cannot *judge* the matter as true; we do not know it as certain, but only as probable. We are still "on the way" to certitude, as it were. Still we would readily admit that what we are aiming at, what we look forward to, is the time when we can have certitude in our views, if, indeed, they can admit of certitude. Hence these two sectors of knowledge, the probable and the certain, are distinct, but not unrelated. If this were to be expressed in the terms used by the medieval commentators, it would be said that the *via inventiva* precedes and is ordered to the *via iudicativa*: discovery disposes to judgment just as opinion does to scientific knowledge. Aquinas, for instance, compares the movement of human intelligence in inquiry and judgment to a kind of circling, according to which reason, starting from principles in the *via inventiva*, arrives at conclusions, and then resolves the conclusions discovered into principles in the *via iudicativa*.<sup>1</sup> A further relation between probable reasoning and demonstrating should be noted. If one has reached the point where he knows the real reason why something is the way it is, he is thereby more capable of finding probable signs to show this also. In this sense, then, dialectical reasoning may be said to follow demonstration.<sup>2</sup>

Although it may be true that inquiry is more "natural" to man than judging,<sup>3</sup> the process is not always carried on artfully, that is, in an orderly and economical way. Hence the need for logical direction, and for such a treatise as Aristotle's *Topics*. The direction that logic can give to the act of judgment is, however, different from this. A demonstrative reasoning can be made only by one who knows the real principles of the things concerning which he is demonstrating. Logic obviously cannot provide these principles, but it can at least analyze that process of reasoning which would result in scientific knowledge, and thus teach

1. ST. THOMAS, *De Ver.*, q.10, a.8, ad 10.

2. Cf. ST. THOMAS, *IIIa*, q.9, a.3, ad 2.

3. See the comparison St. Thomas makes in *IIa IIae*, q.51, a.3, c.

what is necessary for judgment of the truth to be made. This, it seems, is what Aristotle's *Analytics* is meant to provide.

A further point which should be clarified is that of the order in which Thomas Aquinas places these books of Aristotle in the *Organon*, the order, of course, in which the early cataloguers placed them. If in the speculative order discovery or inquiry precedes judgment, why is it that when these processes of reasoning are studied in logic, attention is paid first to that process which actually comes later, if at all? The answer is not difficult. Necessity of consequence which is involved in reasoning is found most perfectly in demonstration, which involves, in addition, necessity of the consequent. Thus after the study of syllogism absolutely in the *Prior Analytics*, it is proper, in the order of determination, to take up the consideration of demonstrative reasoning before the dialectical kind, which is a less perfect kind of argument.<sup>1</sup>

If the subject and the purpose of the *Posterior Analytics* have been clarified albeit rather abstractly, it seems necessary now to find more concrete evidence regarding how this treatise may be related to the *Topics*. Two short passages from the text of the *Topics* itself, where Aristotle speaks respectively of dialectics in relation to problems of definition, and the uses of the art of dialectics, will serve the purpose.

### *Science and the "Topics"*

#### *A. Problems of Definition*

In the first sentence of the *Topics* Aristotle spells out the aim of the book:

The purpose of the treatise is to discover a method by which we shall be able to reason about any problem from probabilities, and by which we shall ourselves, when engaging in disputation, say nothing obstructive.<sup>2</sup>

As a matter of fact, and as noted above, most men can argue with relative ease even if they never come to any definite conclusion. But arguments may proceed in a disorderly fashion, and go on and on without coming to any term at all. It is the purpose of the *Topics* to discover

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1. "... quia consequentia quae est in syllogismo, in demonstratione accipit firmitatem: ideo post hoc (that is, after the *Prior Analytics*) de *Posterioribus* resolutoriis oportuit determinari. Et quia syllogismus demonstrativus addit supra consequentiam syllogismi, etiam consequentis necessitatem, quae sciri non potest nisi per resolutionem consequentis in principia ipsius. His ergo jam declaratis, ad syllogismum dialecticum accedendum, qui diminuit a consequentis necessitate: quia probabile ex probabilibus syllogizatum, consequentis non habet necessitatem. Propterea in scientia logica scientia libri *Topicorum* post librum *Posteriorum* est ordinanda." ST. ALBERT, *In VIII Topicorum*, I, prooem., c.1.

2. ARISTOTLE, *Topics*, I, c.1, 100 a 18-21. The translation is ours, based on the text of the Loeb series (London: William Heinemann Ltd., 1960).



a method or "short-cut" to terminate problems, whether speculative or practical.<sup>1</sup>

Still, it might seem like an overwhelmingly ambitious undertaking to find a method for reasoning about *every* problem. It is obvious that this can be done only if all problems can be reduced to a finite number. In his commentary on this passage, Albert assures us that this is possible, for, he writes, any problem is a problem of inherence (*inesse*); inherence as accident, genus, property or definition. When we can reason "with art" concerning any of these four sorts of inherence, we can thus syllogize every problem.<sup>2</sup> Aristotle himself writes that every problem indicates either property, definition, genus or accident.<sup>3</sup> When he comes to explain what each of these predicates means, however, he starts with definition,<sup>4</sup> with good reason it seems, for nothing so inheres in a subject as that which is in it as a definition, which notifies the whole of what something is.<sup>5</sup> Then after describing what each of these predicates is in particular, the Stagirite notes that all of the cases are, in a sense, definitory.<sup>6</sup> This is not to be understood as if each and every problem were one of definition in such a way that by the method in which a problem of definition is terminated problems regarding genus, property or accident are terminated. The meaning is rather that the other sorts of problems are aids or helps, at least by way of removing obstructions, for problems of definition. It can be shown, for example, that the predicate assigned is not in the subject at all (accident), or not in it *only* (property), or not in it as its genus, the first part of a definition, then it would be clear that a predicate proposed as a definition is not really one at all.<sup>7</sup>

It seems significant that the principal problem to be dealt with in the *Topics*, that to which the others are ordered, concerns definition. If it is true that in the *Posterior Analytics* Aristotle places a great deal

1. "Est autem quod dicimus methodum metaphorice: dicitur enim *methodus* brevis via, quae via est compendii, et vulgariter vocatur summa. Per similitudinem ergo transfertur ad istam scientiam proprie et artem: quia cum speculabilia et operabilia multa offerantur, sua multitudine et longitudine, distantiae quidem ipsorum dispendium faciunt, nisi per formam scientiae et artis ad compendium redigatur: et ab hac similitudine nomen methodi ad artem et scientiam transfertur." ST. ALBERT, *In VIII Topic.*, I, prooem., c.2.

2. ST. ALBERT, *ibid.*

3. ARISTOTLE, I, c.4, 101 b 24-26.

4. *Ibid.*, I, c.5.

5. "Et quia diffinitio dicit totum esse, ideo a diffinitione incipemus. Nihil enim ita inest subjecto, sicut id quod inest ut diffinitio. Adhuc autem quoniam omnia alia ad diffinitionem aliquo modo ordinantur, ideo diffinitio principalior est: et ideo ab ipsa hic incipemus." ST. ALBERT, Tr. II, c.2.

6. ARISTOTLE, I, c.6, 102 b 36.

7. "... omnia alia erunt quodammodo diffinitiva, hoc est, ad problema de diffinitione adminisculantia. Dico autem *quodammodo*, quia destructive, et non constructive. Omnia enim quae enumerata sunt hoc modo, faciunt ad diffinitionem per modum adminisculationum et secundum bene esse." ST. ALBERT, Tr. II, c.6.

of the burden for the constitution of a demonstrative argument on definition (it is, in fact, the first and proper principle of demonstration),<sup>1</sup> and if problems of definition are the main concern of the dialectician, then there is another way at hand to see just how the *Topics* is related to the *Posterior Analytics*, or how the *via inventiva* is related to the *via iudicativa*, and finally, that there is consistency within Aristotle's logic.

### B. *The Uses of the Art of Dialectics*

Aristotle was quoted above regarding the purpose of the *Topics*: to discover a method to reason about any problem and, in argument, to avoid saying anything that would be obstructive. In the second chapter of the first book of the treatise, he goes on to say that the art of dialectics is useful for mental training, encounters, and the philosophical sciences (πρὸς γυμνασίαν, πρὸς τὰς ἐντεύξεις, πρὸς τὰς κατὰ φιλοσοφίαν ἐπιστήμας).<sup>2</sup>

The *Topics*, then, is useful for "exercise." The word *γυμνασία* which meant first of all those activities that the aspiring athlete performs to make his body fit for competition, here refers obviously to mental or rational practice. It was argued earlier that logic is an art necessary for one who would reach and judge the truth in an orderly fashion, without error, and with ease. Now logic could very well teach the correct order to follow without making the operation of inquiring reason any easier. Ease and facility cannot be taught; they must come from actual exercise or practice, just as any *habitus* comes from the repetition of acts. It is only after some practice that one can possess not only knowledge of the rules of logic, but a true possession of the logical *habitus*.<sup>3</sup> This, then, is one of the uses of the *Topics*: it aids the actual exercise, the very use of logic, or what the Scholastics called *logica utens*, and thus the fulfilment or perfection of the habit of logic.

The logical *habitus* is thus not fully possessed without practice or exercise. It is clear that what is meant is the practice of dialectics, not of the analytic part of logic. For the analysis or resolution of the scientist, logic can indeed teach in general how to proceed, but the use or practice of this can come only in the sciences themselves, not in logic,

1. This is proved in *Posterior Analytics*, I, cc.6-9.

2. ARISTOTLE, I, c.2, 101 a 25-28.

3. "Omnis autem habitus facultatem conferens ad facile de proposito arguendum de utraque parte contradictionis, valet ad exercitationes, hoc est, ad frequentes artis operationes, per quas facilius semper efficitur artem habens: ergo ista ars valet ad exercitationes." ST. ALBERT, Tr. I, c.5. "... religionem intrantes, non statim perfectionem adipiscuntur, sed ad perfectionem assequendam se exercent, sicut et intrantes scholas logicae, non statim efficiuntur logici, sed ad hoc se exercent..." ST. THOMAS, *Quaestiones Quodlibetales*, ed. R. Spiazzi (Turin: Marietti, 1956), IV, q.12, a.2, ad 6.

for the simple reason that analysis consists in "using" the real principles of things from which one demonstrates, not in using logical intentions.<sup>1</sup>

If it is true, then, that logic is necessary for the sciences, and if the logical *habitus* cannot be fully possessed without practicing it, then one who desires scientific knowledge must engage beforehand in dialectical exercises. The importance of such exercises as a preliminary to the speculative sciences is by no means underrated by the Stagirite. For example, he pays tribute not only to those predecessors of his who contributed to the truth, but also to those who expressed superficial opinions. "They too contributed something, for they formed our *habitus* by practice."<sup>2</sup> Commenting on this, Thomas Aquinas notes first, that predecessors can contribute to the consideration of the truth both directly and indirectly inasmuch as their errors present to posterity the occasion for *exercise*, with the result that after discussion the truth will be more clearly apparent.<sup>3</sup>

The practice of logic is thus meant to render the possession of logic perfect, and ultimately to prepare for scientific study. This practice is meant to be made possible by the *Topics: dialectica docens* is useful for *dialectica utens*. And the *via inventiva* is ordered finally to the *via iudicativa*.

The treatise of the *Topics* is useful secondly for *encounters*, "because, having enumerated the opinions of the majority, we shall be dealing with them on the basis of their own opinions, not of those of others, changing whatever does not seem to us to be said well."<sup>4</sup> So important are such encounters that Plato could insist that even the individual by himself should engage in an "inward dialogue carried on by the mind with itself without spoken sound"<sup>5</sup> and Aristotle would write that "if we cannot find anyone else to argue with, we should argue with ourselves."<sup>6</sup>

Demonstration seems to involve the inference of a necessary conclusion which was not known as certain before being demonstrated.

1. Cf. ST. THOMAS, *In I Post. Anal.*, lect. 20, n. 171; *In IV Metaph.*, lect. 4, n. 577.

2. ARISTOTLE, *Metaphysics*, II, c. 1, 993 b 14. Ross, following Bonitz, explains that this proleptic construction is to be understood as "by practice they transformed a natural *δύναμις* into a trained *ἐξήκτις*." W. D. Ross, *Aristotle's Metaphysics* (Oxford, 1958), Vol. I, p. 215.

3. ST. THOMAS, *In II Metaph.*, lect. 1, n. 287. Aquinas makes his own the view of Hugh of St. Victor that the liberal arts like dialectics are necessary for one who would learn philosophy, "eo quod his quasi quibusdam viis *vivax animus* ad secreta philosophiae introeat." *In Boeth. de Trin.*, q. 5, a. 1, ad 3.

4. ARISTOTLE, *Topics*, I, c. 2, 101 a 32-34.

5. PLATO, *Sophist*, 263 E.

6. ARISTOTTE, *Topics*, VIII, c. 14, 163 b 3. This is so because any problem implies arguments "for" and "against": "... quia in probabilibus si affirmatio est probabilis, etiam negatio opposita probabilis erit, quia quod potest esse, potest etiam non esse..." ST. ALBERT, *In VIII Topic.*, I, Tr. I, c. 5.

But the only reason why one would seek to demonstrate something is that it is already known as capable of being proved. In other words, it is seen as provable. But something cannot be known as provable unless it is known to be probable as opposed to the statement contradicting it. Something is probable, however, if a reason can be given to accept it, and if there is no reason to doubt it. But if some reason is proposed, for example, by a predecessor, which casts doubt on what one intends to demonstrate, that reason must of course be examined in an encounter or dispute. Even if there are not at hand the positions of predecessors, one should "think up" reasons a silent "inward dialogue." The result of such an encounter is that one learns from the thoughts of previous thinkers, and establishes the probability of one's own position, thus preparing the way for its scientific resolution. This use of dialectics is, therefore, directed ultimately to demonstration by preparing the way for it.

The third use of the art of dialectics that Aristotle lists — *πρὸς τὰς κατὰ φιλοσοφίαν ἐπιστήμας* — is, however, its most important use.<sup>1</sup> He notes that in regard to the philosophical disciplines, the study of dialectics has utility because "if we are able to raise difficulties on both sides, we shall more easily discern the true and the false for each point."<sup>2</sup> This should now be obvious from what has been said concerning the first two uses he names. But he writes further that dialectics is useful in regard to the principles of each science. In fact, no particular science can discuss its first principles on its own ground, since the principles on which the science is based are the very basis of what is derived from it. The principles, then, of any science must be dealt with on the basis of what is probable. "This belongs properly, or more appropriately to dialectics for, being inquisitive, it has a way to the principles of all methods."<sup>3</sup>

Again, this only confirms the fact that the *via inventiva* is ordered to the *via iudicativa*, and that dialectical argument prepares for scientific judgment, and may, in fact, be made use of in science itself. This very special use of the art of dialectics in scientific discourse for

1. "L'expression *ἐν τοῖς κατὰ φιλοσοφίαν* désigne toujours les traités scientifiques en général, par opposition aux *Dialogues*." P. LOUIS, in *Aristote : Les Parties des Animaux* (Paris, Société d'Édition "Les Belles Lettres," 1956), pp.170-171, note 5.

2. ARISTOTLE, I, c.2, 101 a 35-37.

3. *Ibid.*, 100 b 2-4. "Amplius autem ob hoc ad secundum philosophiam disciplinas utile est hoc negotium: quia ad prima, hoc est, ad principia philosophiarum quae sunt circa unamquamque disciplinam: nulla enim philosophia quae est de ente determinato est stabilire potest sua principia, sed accipit ea stabilita ab ea quae est de ente communi considerans in quantum est ens: quia impossibile est aliquid dicere de principiis ex convenientibus et propriis, quae sunt circa unamquamque disciplinam, eo quod uniuscuiusque principia sunt prima omnium in genere illo: et ideo per nulla quae ante se habeant in illa disciplina, poterunt determinari et stabiliri ex propriis: sed per ea quae sunt communiter circa singula probabilia, non causalia autem, necesse est de his principiis singularum philosophiarum pertransire non profundato sermone." ST. ALBERT, I, Tr. I, c.5.

the "stabilization" of its principles as mentioned here in the *Topics*, helps to explain how it is that a scientist can deal with the "hypotheses" and "axioms" of his science, a function considered necessary but not given explicit treatment in the *Posterior Analytics* where Aristotle is speaking of the role of proper and common principles in science.<sup>1</sup>

A place has been found, thus, for both the *Posterior Analytics* and the *Topics* within Aristotle's logical writings. The purpose of the *Posterior Analytics* is to provide a basis for judging whether or not scientific procedure is being or has been carried on well or not. It does not have as its purpose to guide scientific inquiry, nor does it necessarily pretend to teach a "scientific method" of discovery. This is the task, rather, of the *Topics*, a treatise which is not therefore made "out of date" by the *Analytics* at all. The two treatises, in fact, seem to complement one another: the *Analytics* teaches the *via iudicativa*, while the *Topics* studies the *via inventiva*. The use of the *Topics*, moreover, is not restricted merely to "general culture," or to the "popular" reasonings of the dilettante, but is explicitly meant to be of service to the scientist himself, by way of preparation in exercises, in the termination of problems which can then be solved scientifically, and in the stabilization of hypotheses and axioms, the common principles from which he proceeds.

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1. *Post. Anal.*, I, cc. 10-11. Cf. ST. THOMAS, *In I Post. Anal.*, lect. 19-20; ST. ALBERT, *In Post. Anal.*, I. Tr. III, cc. 1-4.