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# Aristotle's *Logikē* (Art of formal argument): Theoretical foundation of Dialectic and Ontology

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**Abstract:** Aristotle's development of his method of dialectic is carried out not dialectically in the realm of opinion, but philosophically through the *logikē* method. This formal and universal dimension is ultimately founded in the most certain principle of non-contradiction. It constitutes the art of argument which offers the basis for logic as well as ontology. Since Aristotle devised 'dialectic' at an earlier stage in his career, the theoretical part of dialectic, as the *logikē* art of argumentation, can be employed in all his other theoretical works, even if the peirastic practice of dialectic remains a peculiarity of the *Topics*.

I shall argue that (a) the method of Aristotelian dialectic consists of theories of (a1)(a2) terms and predications and (a3) *topos* and (a4) syllogism. This method is at work not only in this undertaking edited as the *Topics* but also in his theories of demonstration and being in other undertakings. Only when the theories of demonstration and being are added, can Aristotle complete his project, to show how an Academician can act as both a philosopher with knowledge and as a dialectician who dialectically examines any thesis proposed. This is because he began his initial project with aim of strengthening weak Socratic dialectic by establishing a formal system to grasp what a thing is.

When Aristotle composed and edited the *Topics*, he reflected on the history of his project, mentioning at various occasions the products of other undertakings as well. Through these theoretical studies, such as the theories of division and demonstration, he can describe one goal of initial project as submitting and defending a thesis more specifically 'as the person having knowledge' (*Top*.II. 100a20, IX32. 183b3). No one can deny that one can defend one's thesis better, if one has knowledge.

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## I. Introduction: Socrates' fight against Sophists as the origin and legacy of Aristotelian dialectic

In this essay, I shall investigate Aristotle's project, which is traditionally called 'dialectic', mainly in the *Topics* (including *the Sophistical Refutation* (*Top*.IX)). I shall seek to clarify what Aristotle achieved in this project and how he overcame various difficulties inherited from his predecessors. Although it has been queried, as for example by G. Ryle who fails to distinguish the theory of dialectic from its practice says, that 'we get the impression that in the Academy at the same moment the word 'dialectic' is being used

in two entirely different ways<sup>1</sup>, there is no doubt that Plato and Aristotle shared the project of overcoming the same difficulties at that time in the Academy.

While they inherited both Socrates' tradition of refuting sophists and his method of inquiry by argument alone, they also were aware of the deficiencies of Socratic inquiry into what a thing is (eg. *Phaed.* 100d, *Tim.* 50b, *Soph.* 242e). They urgently needed to devise a method of argument as a formal system of producing knowledge. A sophist, called 'antilogikos' by Plato and Aristotle, is the 'controversialist (enemy of reason)' who professes to offer a refutation of any thesis proposed by appealing to his eristic art merely for his own benefit (eg. *Resp.* 454a, *Soph.* 225b, 226a2, 232b, *Phaedr.* 261b, *Theae.* 164c, *Top.* 105a18). Plato's Socrates who 'takes refuge in words/arguments (*logūs*) to consider the truth of things in them', by confining himself to say only 'the most certain (*asphalestaton*)' and 'the strongest (*errōmenēstaton*)' thing, disregarding the inquiry by observation 'in works (*en ergois*)' of any particular *prāgma* (*Phaed.* 99e, 100a, d). Plato's Idea is introduced by such tautological claims as 'It is by beauty that beautiful things are beautiful' (cf. *Top.* I 11, 14, *Phaed.* 100 a, d, e, *Tim.* 49 d).

In order to refute eristic or fallacious arguments by sophists, Aristotle develops, as I shall argue, the dialectic on the basis of the analysis of normative expressions called 'the method of formal constructive argument (*logikōs* : adverbial methodological expression of *logikē*, (either noun or adjective))'. Following and christening the Academy's Socratic second journey as '*logikē*', Aristotle develops '*logikē*' so as to constitute the theory of dialectic by saying the steadfast things under the guidance of 'how one ought to say (*pōs dei legein*;)', 'how one ought to ask (*pōs dei erōtān*;)' and 'how one ought to define (*pōs dei horizesthai*;, *pōs horisteon*;)' (*Top.* VII3.153a12, VIII1, I55b3, II2.105a19, VII3, 153a12, *Met.* VII.1026a4, VII4.1030a26). In this he fought alongside Plato against the sophists who are called '*antilogikos* (enemy of logic (formal argument))' by both of them.

This normative way of saying '*logikē*' is fundamentally grounded by the principle of non-contradiction which is 'the most certain principle (*bebaiotatē*) of all principles' (*Met.* IV4.1005b22, cf. *logikas duscherias* (b22)). An example of *logikē* manner (*logikōs*) is found in his criticism of the Megarians who deny the movement by holding that any present activity implies the impossibility of its contrary: 'It is not permitted to say (*mē endechetai tauta legein*)' that a man who sits cannot stand, since man who sits always sits (IX3.1047a18). 'The impossibility' must signify the negation of not mere fact but of possibility.

The contrast between *antilogikos* and *logikos* offers a way to characterize the distinctively Aristotelian, and theoretical, part of dialectic. I shall argue that Aristotle devises an art called '*Logikē*' in the *Topics* within the undertaking of dialectic by making use of examples of dialectical problems so that it can comprise the most universal sphere whose universal issues are interested and dealt with only by 'philosophers (sages: *sophoi*)'. Since all theoretical studies are fundamentally based on the *logikē* investigation, the *logikē* method of dialectic as the *logikē* art is succeeded and shared by his ontology in the *Metaphysics*.

## II. Inventing the Method of Dialectic and its Scope

Aristotle begins The *Topics* by setting out the purpose of his undertaking:

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1 Ryle, [Progress] p.127. cf.Fink, [Dialectic] p.1.

The project of this undertaking (*tēs pragmateias*) is to invent (a) a method (*methodos*) whereby (b) we shall be able to (*dunēsometha*) syllogize from reputable opinions (*endoxōn*) about every problem proposed, and (c) also we will not say anything conflicting, when submitting an argument ourselves. First, then, we must say what a syllogism is (*ti esti sullogismos*) and what its different varieties are, so that the dialectical syllogism may be grasped. For we seek for this according to the undertaking which lies before us (100a18-21, cf. *heuronta technēn* (inventing an art) 981b13-20).

The method (a) which the undertaking seeks is designed to enable the Academicians referred to by 'we' (b) to perform the dialectical practice of examining a thesis by offering *pro* and *con* dialectical syllogisms and (c) to submit their own coherent claims and defend them when they were attacked. What Aristotle sought to discover is, generally speaking, a kind of art of argumentation through which a trainee can become a good interlocutor and good presenter of arguments on controversial issues which call for discussion (cf. 101a25-b4, *Rhet.* 12.1356a33: 'some power-abilities to provide arguments (*porisai logūs*)'). Aristotle developed an account of (a) the method of what counts as good argument, one which allows us to properly do (b) and (c). The theoretical part of dialectic which underlies (b) and (c) determines whether they are properly conducted. When Academicians are trained, they should be able to perform as dialecticians with the required syllogistic skill. Knowing 'what a syllogism is' is required in order to grasp the theory of dialectical syllogism, although syllogism is used in the *Topics* 'according to the undertaking which lies before us (*prokeimenēn pragmateian*)' (100a21). That is, issues of syllogism are discussed, only insofar doing so facilitates to perform the dialectical practices (b) (c).

In a dialectical context, syllogism and induction are contrasted by the type of people to whom they are addressed; 'Induction is more convincing and clear and more known according to the sense, and is applicable generally to the mass of men; but syllogism is more forcible and more effective against controversialists (*pros tūs antilogikūs*)' (*Top.* 112.105a16-19, cf. *Rhet.* III 17.1418b1: 'exact argument (*logon akribē*)'). This passage shows that, at the theoretical level, Aristotle devises the syllogism in part to challenge sophists' fallacious arguments. Aristotle fully makes use of the forcible reasoning based on logical necessity which is systematically discussed in the *Prior Analytics*. Socrates' struggle against the sophists is the context in which Aristotle developed dialectic as an art of argumentation.

It is natural to suppose that the method and its products are mutually constrained. While the success of method is measured by the extent to which its goals (b) (c) are achieved, its goals (b) (c) are totally dependent on and governed by the method. But if some parts or constituents of (a) the method are so fundamental as to be applicable to any theoretical study, the cognitive abilities (b) (c) enhanced by learning the method will be so effective that they may not be exhausted by the relevant practices carried out by dialogue.

Given the wide scope of project, it is not surprising that Alexander points out the varieties of understanding of the dialectic in ancient philosophy by saying that 'the name of dialectic is not by all philosophers brought to bear on the same thing meant'<sup>2</sup>. While Stoics hold it to be a philosophical work as 'knowledge of speaking well', 'Aristotle and his school', in Alexander's interpretation, consider the epistemic contents of the syllogism: 'dialectic does not have its being in syllogizing through what is true but through what is approved'. We need to have a clear grasp of what the relation is between dialectical practice and its theory as a philosophical activity.

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2 Alexander, [Topica] p.3, 1.1 (2).

I believe that while ‘the project of this undertaking’ in the early stage of Aristotle’s career contains elements of a meta-theory which is generally regarded to be a theory of theories, he carries it out under the name of ‘the undertaking about the dialectic’ by following the Academy’s tradition (*An.Pr.*130.46a29). Since the theoretical parts of dialectic, especially I4-9 and I11, 14, contain ingredients of meta-theory, what is achieved in this project is distributed to and shared by its neighboring intellectual activities such as logic, demonstrative science, rhetoric and ontology which are distinguished only by the subject-matters. In turn, the treatise *Topics* contains and presupposes, in its editorial stage, works and outcomes of these neighboring disciplines. This is possible because dialectical practices are designed to be assisted by other disciplines which share the method as *logikē*. I shall argue that Aristotle has devised elements of meta-theory within his general plan of dialectic and developed this meta-theory as the art *Logikē* (the art of formal constructive argument). Since they share this basic method mainly developed in the undertaking called ‘dialectic’, each particular field and the mutually complementary contributions of these disciplines can be clearly marked out.

While Aristotle has a clear view of the roles of his *sui generis* dialectic by constraining it to dialectical practice based on ‘*endoxa* (reputable opinions)’ and ‘dialectical syllogism’, he placed dialectic in his intellectual system so as to make it compatible with and mutually beneficial to other disciplines<sup>3</sup>. Rhetoric or the art of persuasion, for instance, ‘is the counterpart of dialectic’ (*Rhet.*II.1354a1). This is because all men attempt to discuss statements and to maintain them, to defend themselves and to attack others. Persuasion and examination belong to the same faculty of soul, although their goals are different. The demonstrative science which is concerned with producing knowledge under the axiomatic system will contribute to dialectical practices by providing knowledge for dialecticians (e.g., *An.Post.*12, 72a8-11, *Rhet.* II.1354a1-5).

I shall argue that some constituents of (a) the method which are the theories of (a1) terms and (a2) predications, of (a3) *topos* (its some parts) and of (a4) syllogism can be applied to any such theoretical study. This is because Aristotle invented the *logikē* art during the activity traditionally called ‘dialectic’ initiated by Socrates. This is also because the *logikē* is the solid basis of any theoretical study including the study of dialectic itself. Inventing (a) the method in this undertaking is inherited from as well as developed and shared by other theoretical studies such as the first philosophy, including universal ontology and theology (*theo-logikē*) (*metaphysica generalis et particularis*). In turn, philosophical knowledge may contribute to dialectical practices.

I believe that while Aristotle sets out in the *Topics* the ways of grasping what it was to be (essence)

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3 When Aristotle mentions ‘*dialektikē*’ together with its adjective and adverbial usages, he has definitely dialectical practices under (a) the method as a whole in mind. In fact, he employs the name ‘*dialektikē*’ whose adjective is often qualified by ‘proposition’ and ‘syllogism’ in order to compare with other disciplines such as ‘syllogistic (logic)’ and ‘demonstrative’ and ‘rhetorical’, ‘sophistic’ arts and philosophy (20b22, b27, 24a23, b10, b14, 46a9, a30, 68b10, 72a9, 77b39, 81b19, 403a2, 987b32, 1004b17, b23). This is because what delineates the dialectic from other disciplines must be *sui generis* its practice that examines any thesis by taking the form of dialogue in the sphere of opinion. When Aristotle refers to the *Posterior Analytics* as ‘the accurate another study’ concerning the syllogism of essence, he thinks the theoretical issues such as this in continuation or close relation on the basis of the meta-theory (VII3.153a14). Insofar as Aristotle explains how logic and demonstrative knowledge contribute to practice of dialectic, he can secure its distinctiveness as an art. In fact, when Aristotle refers back to the *Topics* in other treatise, he mentions ‘the undertaking about the dialectic’ (46a30: on his mutual references among his works, e.g., 20b27, 24b11, 49a7, 64a37, 65b16, 73b14, 86b10, 91b14, 141a29, 153a14, 1396a24, a34).

through syllogism which Socrates sought for in his dialectic, leaving detailed discussions to other treatises, the dialectical practices themselves are strengthened within the realm of opinion under the auspices of neighboring disciplines. Nevertheless, by the use of other method of argument such as knowledge-producing syllogism, it is possible to move from the mere reputable opinion to 'the most reputable opinions (*endoxotaton*)' to increase the convincingness of one's opinion (183a37).

Thus Aristotle under the guidance of Plato sets out at least three objectives of treatise on dialectic. One aim is called '(b) a practice of dialectic in itself and the peirastic (*ergon esti tēs dialektikēs kath' autēn kai tēs peirastikēs*)' by means of which a dialectician can dialectically examine any thesis proposed without being required to have knowledge of the relevant thing (183a39). By modifying 'the dialectic' with 'in itself', Aristotle shows that the original and central task of dialectic is Socratic examination of any thesis proposed. By keeping the sphere of opinion as a characteristic of dialectic *sui generis*, he does not require participants to have the relevant knowledge. He says that 'the peirastic is not like geometry, but an art that may be possessed by a man who lacks knowledge' (IX11.172a21). Since this is a unique characteristic of dialectic, it is important to keep the sphere of opinion, the only sphere in which one can offer *pro* and *con* opinions on *any* issue. Thus his theory of dialectic is partially designed for non-specialists or anyone who is engaged in dialogue following Socratic tradition of dialectic. Earlier, Plato's Socrates said that 'you would call a dialectician him who knows how to ask and answer' (*Crat.*390c, cf. *Phileb.*17a, *Resp.*533c, 534b, e).

The second of Aristotle's aims is to design dialectic so as to be 'useful (*chrēsimos*)' for 'sciences according to philosophy' (101a27). Dialectical problems are said 'not to be things which we do wish to know by themselves' but are 'useful' for the knowledge of such issues as 'everything is moved' and 'being is one' (104b6, 10, 21-22). This is 'because we who are able to puzzle on both sides of a subject will detect more easily the truth and error about in each subject' (101a34-36). Dialectical practice is not confined to the mere practice of examining other views but is located in a positive role in leading to philosophical knowledge. The fact that dialectical problems are not designed to be investigated in themselves implies that dialectical practice presupposes philosophical activity. This demands an account which connects dialectical and philosophical practices.

The third objective of this undertaking is concerned with constructing a theory of these dialectical practices. Aristotle positions dialectic in its meta-theory '*logikē* art' within his intellectual system. Philosophers make use of dialectical practices to gain knowledge of such things as 'movement' and 'being' which are initially raised as dialectical problems(104b18-22). He is confident of having grasped these notions in his further philosophical undertakings. Aristotle regards that his definition of 'movement' by appealing to the modal notions as 'the completeness of power-able things *qua* power-able (*dunaton*)' 'was properly said (*kalōs eirētai*)' in *Physics* III1, 2 (201a10, b16-17). By 'modal definition' I mean the one composed of three general words signifying the modes of being of such entity as substance: 'completeness (*entelecheia*), 'at work-ness (*energeia*) and 'potentiality, power-ability (*dunamis*)' which are characterized as 'the elements of the entity *qua* being' (*Met.* IV1.1030a30, 1030a21-22). We will see later his philosophical investigation and grasp of 'being' under the *logikē* guidance in the *Metaphysics*.

In this way, Aristotelian dialectic sets out a basis for philosophical investigation to gain knowledge as an extension of traditional dialectic. Without having (a) some ingredients of the method (i.e. sharing a common basis with philosophical activities), it is probably impossible for any dialectical practice designed for other intellectual activities making a contribution to any philosophical science and knowledge.

Although scholars have emphasized its doxastic elements in the *Topics*, Aristotle is concerned with a general method based on *logikē* manner that can be used to advance and defend any theoretical thought. Division and even demonstration are employed for this purpose. Without establishing proper relations between his dialectic and other disciplines and mutual cooperation, Aristotelian project of dialectic in the Academy cannot nurture philosophers through dialectical practices under the auspices of other scientific and philosophical disciplines.

I shall seek to argue how these three objectives are met by making clear that while Aristotelian dialectician is nurtured to become a philosopher ‘as the person who knows (*hōs eidōs*)’ by ‘being additionally equipped’ with the faculty of knowledge-producing argumentative method and skill, he can concede to his opponent by remaining in the realm of opinion so as to perform dialectical debate (183b1-3). Aristotle sets out in his treatment of dialectic a theoretical account of what would count as knowing what Socrates sought for as to how ‘it is possible to generate the syllogism of definition and of essence (*dunaton genesthai horismū kai tū ti ēn einai sullogismon*)’, even if the Aristotelian dialectician *qua* dialectician does not know the essence of a relevant thing (VII3.153a14). This is an outcome of his *logikē* art.

### III. The Socratic Background<sup>4</sup>

Since the Academy followed the Socratic tradition, it is not surprising that Aristotle labels the all-embracing art, applicable to all kinds of arguments, at least initially ‘dialectic’. Aristotle reflects that Socrates’ ‘dialectic’ was ‘at that time, not strong enough (*dialektikē.. ischus ūpō tote ēn*) to enable people even without the what a thing is (*chōris tū ti esti*) to speculate about contraries’ (*Met.*XIII4.1078b23-30). This remark characterizes Aristotle’s project in the *Topics* to be called ‘dialectic’ and I am inclined to take it as the starting point for further developments in this undertaking and perhaps for all philosophical activities in his career. How did Aristotle strengthen it? The art of the dialogue, as Socrates understood it, aimed to <1> acquire knowledge by <2> reaching agreement with the interlocutor through examining his answer and <3> inductively seeking to formulate a definition. Once a definition were established, Socrates hoped to <4> deduce further claims about the thing defined such as one of a pair of contrary properties (e.g. *Gorgias*, 498e: ‘syllogize (*sullogisai*) based on things agreed’). This is why, for example, he said that without <1> (by means of <2> <3>) knowing what virtue is, one cannot <4> deduce one of contrary properties such as whether virtue can be taught or not (*Meno*, 71b, 86d, *Resp.*, 354c). Thus, Socrates’ ‘dialectic’ aims for knowledge by skills <2>-<4>, although it failed to achieve (1) knowledge.

Using the term ‘dialectic’, Aristotle started his career by following the Socratic tradition and overcame Socrates’ ‘weak dialectic’ by nurturing his dialecticians’ cognitive faculties and skills such as defining and deducing. The art of argument may dispense with the means of dialogue, if he invented <4> a device of forcible argument of deduction without requiring interlocutor’s agreement. Aristotelian logic with the system of syllogism is formed as an underlying art of argument which does not require any debate. Even when other specific methodologies such as logic and demonstration are developed, Aristotle does not discard dialectic but rather leaves a special task, similar to that given to the contemporary skill of critical thinking. While dialectical practices are brought about and developed in pursuit of strengthening Socratic

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4 I discussed on this issue in detail at Chiba [Essence].

dialectic, other faculties above mentioned are nurtured to such an extent that they help dialectical practices within the *logikē* framework.

#### IV. The Core Part: Theory of terms and predications

Aristotelian (a) method of dialectic consists of '(a1)(a2) the core part (I4-9)' and '(a3) the instrumental part (I10-18, II-VIII)' and (a4) the syllogism based on these two parts (The origin of syllogism will be discussed in section VII). In I4-9, Aristotle sets out the theories of (a1) terms (*predicables*) and (a2) predications (*katēgoria*). On the basis of this core part of (a) the method of dialectic, he developed its instrumental part (a3) his *topos* theory and (a4) the syllogistic theory. The method is developed by systematizing the theory of terms and predications used in attempting to address the unanswered Socratic 'What is F?' question. Aristotle was certainly convinced that (a) the method in this project must involve not only securing the sphere of opinion but also valid syllogism as the basis for any good argument which cannot be confined to dialectical practices. All theoretical studies can be founded on and developed from this core part devised in the dialectical context.

In *Topics* I4, Aristotle seeks to implement his method. He says that 'We must, then, first consider on what basis (a) our method rests; for if we could grasp with respect to (a1) how many and what kind of things the arguments (*hoi logoi*) take place and (a2) on what basis they rest, and (a3) how we will find a way (*euporein*) with these (a1) (a2), we should sufficiently attain the goal which is set before us' (101b11-14). At the end of I9, Aristotle claims that he has achieved (a1) and (a2). He says that 'These [4 predicables and 10 categories] are the number and variety of things the arguments (*hoi logoi*) are (a1) about and are (a2) made from. (a3) How we will obtain arguments, and the means by which we will find a way with these must be explained' (103b39-104a2). From these two passages, we can see that Aristotle was engaged in (a3) *topos* theory based on (a1) and (a2) so as to find a new way of implementing Socratic inquiry. On the other hand, (a4) his basic syllogistic theory is left for the *Prior Analytics* I4-22.

Aristotle develops his dialectic in an attempt to systematize and improve on the Socratic method of dialogue. Aristotle's basic aim in this project is to develop (<2>-<4>) a way of dealing with opposite claims without <1> asking, let alone answering, Socrates' 'What is F?' question (*chōris tū ti esti*)' (1078b26). His basic approach is most clearly seen when he emphasizes that the dialectician should offer a contradictory pair of propositions to which <2> one can reply 'Yes' or 'No' (158a14-17). Apart from the interrogative corresponding to this type of reply, Aristotle banned all further use of interrogatives as he aimed to secure propositions on the basis of an exhaustive analysis of terms and predications. This is an outcome of the *logikē* investigation 'how one ought to say'.

In order to do so, he had to lay out in a general way all possible exhaustive types of answers which are mutually exclusive to the 'What is F?' question. The exhaustive and exclusive theses are deployed as follows: 'We shall be in perfect possession the method to proceed when we are in a position like that which we occupy in regard to rhetoric and medicine and faculties of that kind; that is, to do the things which we choose is based on the permitted things ([exhaustive thesis] *to ek tōn endechomenōn poiein*), for it is not every method that the rhetorician will employ to persuade, or the doctor to heal: still, if one does not leave behind any of the permitted items ([exclusive thesis] *ean tōn endechomenōn mēden paralipē*), we shall say that he sufficiently grasps the knowledge' (*Top.*I3.101b5-10).

The exhaustive and mutually exclusive types of answer are four, traditionally called 'predicables (i.e.

types of term)’ (I5-8). The four predicables are ‘defining-phrase (*horos*)’ which signifies the what it was to be (*to ti ēn einai*; essence), ‘property’, ‘genus’ and ‘accident’. These are all called ‘definitory (*horika*)’, because any defining activity involves one of them. Among four possible replies to the ‘What is F?’ question, only the defining-phrase is formally supposed to constitute the successful definition realizing the strict identity between the subject and the predicate (defining-phrase). This is the way Aristotle strengthened Socrates’ weak dialectic by developing a new system of questioning and answering.

Although his new theory of terms and predications cannot be confined to dialectical practices, we can safely say that it has a dialectical origin by being brought about in the traditional context of dialectic. ‘The what it (F) was to be (*to ti ēn einai F*)’ conveys a characteristic of Aristotelian dialectic. Grammatically the imperfect ‘*ēn* (was)’ of the phrase is explained as expressing ‘a fact which is just recognized as such by the speaker, having previously been denied, overlooked’<sup>5</sup>. This notion formally expresses the ideal answer for which Socrates sought, each time he repeated the ‘What is F?’ question, reminding his interlocutor that he had overlooked the thing F itself in his initial answer by merely offering an example or an accident of F (e.g. *Laches*, 190e-191e). Three other predicables are determined by taking the essence as their ultimate criterion.

In *Topics* I9, Aristotle introduces the ten categories (*genera*) of predications (CP: *ta genē tōn katēgoriōn*), such as ‘What F is’ and ‘How much F is’, to which all four types of predicables belong by considering various ordinary interrogative forms with the aim of determining the kinds of argument (*Top* I9.103b25, I15.107a3, cf.1026a36, 1051a35). Among the four predicables, while the defining-phrase and the genus constitute (i) ‘of-itself predication’ with which the interrogative ‘What is F?’ corresponds, the property and the accident constitute (ii) ‘of-other predication’ with which the ‘How much is F?’ and the ‘What (How) is F like?’ and other interrogatives correspond (103b36). This establishes the asymmetry between substance terms and other entity terms which leads to the ten categories (*genera*) of entities (CE: *ta genē tōn ontōn*) such as ‘substance’, ‘quantity’ and so on (103b27-39, *Met.*II3.998a32, b4, cf.88b1).

Aristotle confirms that there is an asymmetry between substances and the other categories of entities. A substance term cannot be used in predication of type (ii) since it cannot play the role of a predicate. If someone says that ‘White is animal’, ‘animal’ cannot signify what white is, nor what it is like, nor any of the categories belonging to white. Substance terms can only be used in predications of type (i), while other terms can be used in predications of both types (i) and (ii). Substances can never be predicated of other categories of entities, although other entities can be properly predicated of (i) themselves (e.g. White is a colour) and of (ii) substances (e.g. Callias is white).

In the predication of type (i) ‘Callias is a man’, the term ‘man’ has a dual function: it both says (S1) what Callias is and refers to (S2) a corresponding entity in the world. The dual function is carried out by one single linguistic act: ‘the person (S1) signifying (*sēmainōn*) the what a thing [e.g. Callias] is.... (S2) signifies substance(*ūsian sēmainei*)’ (103b27). It signifies that Callias is a man and signifies a substance, man, exemplified by Callias in the world. In this way, the correspondence of (CP) and (CE) is established. Because of the asymmetry above, (i) ‘What is F?’ question is primarily addressed to substance so that it constitutes the focal structure by relating all other relevant notions (cf.106b29-107a2). Other interrogatives are allocated to type (ii) predications. In all these respects Aristotle can refine and clarify the Academicians’ definitional practices.

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5 Goodwin, [Syntax] p.13.

These theoretical constituents are introduced without invoking *endoxa*, which delimit the domain of dialectical debates. The *theory* of dialectic is to be contrasted with its *practice*, which is described using an adverb ‘dialectically’ (*dialektikōs*) (eg. 81b19, b22, 105b31, 161a33, 183b3, 403a2). Dialecticians *dialectically* examine any proposition that has been proposed, offering *pro* and *con* arguments in the realm of opinion. The *theory* of dialectic, by contrast, is based on the theories of predicables and thus of categories of predications and of entities. It is developed by formal argument in a constructive way (*logikōs*) using universal concepts in a philosophical analysis of being and identity on the basis of ‘how one ought to say’ so as to grasp the essence (I11, I14, cf. 1030a26). Aristotle contrasts two adverbial expressions ‘dialectically’ (*dialektikōs*) with ‘constructive argument by the formal manner (*logikōs*)’ as representing different methodologies as either uttering reputable opinions or stating steadfast things with general terms.

## V. Ingredients and Functions of the *Topos* Theory

Instead of asking the ‘What is F?’ question, Aristotle seeks to answer this question on the basis of the *topos* theory in II-VII corresponding to each of four predicables. In general, ‘*topos*’ signifies the *locus* or point of examining a proposition within the framework of the four predicables<sup>6</sup>.

Aristotle departs from Socratic unified inquiry into the identity by definition offering the *topos* theory as its substitute in *Topics* I6;

All [four predicable] would in a way be defintory. But we should not for this reason seek a single universal method for all cases [as in the Socratic ‘What is F?’ question]: for this is not an easy thing to find, and, even if it were found, it would be very unclear indeed, and useless for the undertaking at hand. Rather, a unique method (*idias.. methodū*) [i.e. the *topos* theory] proper to each of the distinguished genera [i.e. four predicables] must be laid down, and then, starting from the things which are appropriate in each [predicable] case, it will be easier to make our way right through the task before us (102b34-103a1).

What Aristotle attempted in his *topos* theory in Books II-VII is to grasp what Socrates sought for i.e. the essence of each thing, by examining any proposed statement in terms of the four predicables. His final claim in the discussion of *topoi* concerns the defining-phrase: ‘it is possible for there to be the syllogism of definition and of the what it was to be’ (VII3.153a14). Syllogisms, together with the *topos* theory, enable Aristotle to claim that it is possible to syllogize the essence. The theory of dialectic is designed to produce the formal structure by means of which syllogistic knowledge is formed on the basis of the method ((a) (a1-4)), without involving the content of knowledge which depends on empirical accumulations of observed information.

Aristotle, in fact, allocates detailed discussion of this issue to ‘the accurate another undertaking’ (153a11). In *Posterior Analytics* III10, Aristotle considers ‘how there is a demonstration of what it is’ in the context of establishing the causal theory of definition (94a14). This remark implies that, while Aristotle edits these treatises according to the subject matters and soul’s cognitive states such as the realms of opinion and knowledge, the theoretical parts can be shared by other disciplines such as demonstrative science. Aristotle remained sympathetic to Plato’s dialectic in his project of demonstrative science, when

<sup>6</sup> On Isocrates’ earlier use of *topos*, see Kennedy, [Rhetoric] p.45.

he shows in I10 that his causally-based theory of demonstration and the Academy's division-based definition are compatible, although the former supersedes the latter by grasping the cause of a thing *as* its cause (cf.46a35)<sup>7</sup>. Aristotle did not deny that knowledge could be gained by division theory, even if he offered a more powerful device for scientific knowledge. In the *Topics*, Aristotle devises the theory of predicables by division theory, that is, by Plato's official method of philosophical dialectic in its inquiry into what F is. He seeks to build division theory and his dialectic into his new philosophical system.

Aristotle is aware that his methodology is philosophical — in the sense of *logikos* — in the first stages of this treatise. He does not mention any technical term such as 'dialectic' nor 'reputable opinion' at all in the core part I4-9. This suggests that (a) the method in the core part is more general than a method which can only be applied in dialectical practices. In fact, the first line of I10 which immediately follows the end of I9 (above quote) begins with following remark that 'First, *then*, it should be determined what a dialectical proposition and a dialectical problem are' (104a3). He sets out its realm from I 10 onward that 'Now a dialectical proposition consists in asking something that is reputable to all men or to most men or to the wise' (104a8-9). While he is not concerned with dialectical practices and matters at all in I4-9, he considers how the dialectical sphere of opinion can be built into (a3) the instrumental part, so that the cognitive states of dialecticians can be properly dealt with in the theoretical aspect of dialectic.

On the basis of the core part, Aristotle develops (a3) the instrumental part by the *logikē* manner (I10-18, II-VIII). In I13, Aristotle advanced the method of dialectic in this distinctive direction. He enumerates four 'instruments (*ta organa*) through which one will find a way with the syllogisms (*sullogismōn*): first, to grasp propositions; second, the power to distinguish in how many ways an expression is said; third, to find out the differences of things; fourth, the inquiry of likeness (105a21-25). For example in the case of the second, the word 'desirable' can be used either to describe something as 'honorable', 'pleasant' or 'expedient' (105a26-27). While the third is said to be 'useful for both syllogisms about the sameness and otherness and also recognizing what a thing is', the fourth is said to be 'useful with a view to...hypothetical syllogisms and definitions' (108b19). It is through these *instruments* that propositions and thus syllogistic arguments are composed. 'The syllogisms' here require the formal system of deduction Aristotle developed in *Prior Analytics* I. On the basis of underlying logic, the dialectical syllogism which is composed through these instruments works in the realm of opinion by conveying dialectical problems.

Aristotle is engaged with (a3) in I10-18 and in the whole theory of *topos* as developed in II-VII. The final remark of book VII5 is: 'Thus the *topoi* through which we will find a way with respect to each of problems to attack have now been more or less adequately enumerated' (155a37-38). This shows that one can examine any thesis within the whole *topos* theory on the basis of (a1) (a2) the four predicables and the ten categories. For instance, when Aristotle proposes a *topos* concerning 'defining-phrase (*horos*)' which is 'the most difficult' to establish and 'the easiest' to refute among the four, it is examined by delineating it from the other three predicables (155a18). Any result concerning any *topos* must be coherent with all the others. Insofar as the whole *topos* theory is ordered by 'defining-phrase', we can say that it is directed to 'exhibit the substance' (e.g. 140a35, a37, b5). Then it is natural to suppose, as we saw above, that one result of the *topos* theory is to have a syllogism of the essence, which is directly connected to the work in the *Posterior Analytics* (cf.*Top.VII3*). In this way, (a) the method is constituted by these

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7 Chiba [Heuristic]. p.174f, 197.

three parts (a1)-(a4) including (a3) the dialectical sphere of opinion or the doxastic framework and (a4) logical ingredient, all of which together constitute a theory of dialectical practice.

Aristotle provides a parallel discussion of method (a) in *Prior Analytics* I30, where he argues that since the theory of dialectic gives the basis for other studies, the road or method in any study is the same; Thus the road (*hodos*) is the same for all subjects, in philosophy as well as in the technical or mathematical disciplines. For one must (a1) (a2) discern concerning each of two terms, [that is] predicates which belong and subjects to which they belong, and (a3) must find a way (*euporein*) with as many of those terms as possible, and (a4) consider them by means of three terms, refuting statements in this way, confirming them in another, in the pursuit of truth starting from an arrangement of the terms in accordance with truth, while if we look for dialectical syllogisms we must start from propositions according to opinion....Thus we have explained fairly well in general way how one ought to select propositions. We have discussed the matter precisely (*di'akribeias*) in the undertaking concerning dialectic (*en tē (i) pragmateia (i) tē (i) peri tēn dialektikēn*) (46a3-7, a28-30).

Since any study has to focus on a proposition, it shares the procedures concerning linguistic analysis which are developed in method (a1) (a2). I construe that (a3) offers a way of inductive accumulations of issues concerning 'how one ought to select propositions (*hon dei tropon tas protaseis eklegein*)' which correspond to what he does in (a3) the *topos* theory in the *Topics*. The last remark of the chapter which emphasizes the accurateness (*akribeia*) of his *topos* theory confirms this reading. Aristotle here asks readers to consult with the works in the *Topics* which were carried out in a precise way as the basic study of this road or procedure. Such mutual references like this, found among *Organon* and other works, endorse that Aristotle has carried out his project in a systematic way with a steadfast grip of what he has been working on (See note 3). After Aristotle discusses a *topos* about proof by *reductio ad impossibile* which is one way to select a starting-point in the previous chapter I29, he sums up what should be done to prove an issue (first discussed in I30). Earlier Aristotle sets a new task in I27 that 'We must now state how we will find a way of syllogisms in reference to the issue proposed (*pros to tithemenon*) and by what road we will reach the principles relative to each issue' (I27, 43a20-23, cf.II1.53a1-2). It is stated here that (a3) (a4) are carried out by the syllogism involving three terms. By following this road in a parallel fashion, Aristotle has developed to some extent any art and science such as logic, demonstrative science, rhetoric and ontology through the study carried out in the *Topics*.

In the same vein, Aristotle introduces the word 'dialectic' in a passage of *Rhetoric* II as the term which covers the study of all kinds of syllogistic forms such as demonstrative and rhetorical ones: 'Now, it is the task of dialectic as a whole, or of one of its parts, to consider every kind of syllogism in a similar manner' (1355a8). Since the theoretical part of 'dialectic' which is perhaps expressed as 'one of its parts' governs every theoretical study, by 'dialectic' Aristotle means (a) the methodological basis of every such science and art. There was at least a certain period of time when Aristotle considered all kinds of syllogisms under the art called 'dialectic'. He mentions in the *Rhetoric* that the person who learns the basis of syllogisms is best skilled in considering every kind of syllogism, if he has been well informed about the subject matter. He says that 'a man who is best able to see (a) how and from what elements a syllogism is produced will also be best skilled in the rhetorical syllogism (*enthumēma*), by grasping additionally about what kind of a thing its subject-matter is (*proslabōn peri poia*) and in what respects it differs from the formal syllogisms (*tūs logikūs sullogismūs*). For the true and the approximately true are apprehended by the same faculty [since the person who knows most about the truth will produce the most

persuasive rhetorical syllogism]’ (1355a10-15).

By characterizing the basic syllogism as (a4) ‘the formal (*logikūs*) syllogisms’, Aristotle distinguishes syllogisms concerning the structure of valid argument from syllogisms used in rhetorical and knowledge-producing areas (1355a13). These passages suggest that he started devising the art of arguments as a whole under the name of ‘dialectic’, although its theoretical part as ‘one of its parts’ should be called ‘*logikē*’. There is no contradiction differentiating between dialectic which is designed to deal with any solid art of argument and dialectic whose practice is confined to the sphere of opinion. Epistemological contents are carried on the basis of the logical system by ‘grasping additionally about what kind of a thing its subject-matter is’.

Knowledge of the relevant thing is required for his argument to be convincing. G. W. Most says that ‘the better an argument is philosophically, the better it will be oratorically and the likelier it is to win’<sup>8</sup>. Insofar as the acquisition of information about the relevant area is transmitted by the proper formal system, it gains the reliability of truth and persuasiveness for any scientific discipline, rhetoric and ontology. The *logikē* art involves such *logika* notions as ‘the what it was to be’, ‘categories’ of predications and entities which are main ingredients in his investigation of ontology. Broadly speaking, he can call what he has achieved in the undertaking edited in the *Topics* ‘dialectic’, insofar as its theory and practice have a Socratic origin. Within such tradition, its theoretical parts can be further developed up to the mature point in which some should be called independent arts.

## VI. Introduction of *Logikē* Art

I shall now argue that Aristotle devised (a) the method by formal constructive argument, the *logikē* art. Having introduced ‘dialectical proposition’ in *Topics* I10, Aristotle characterizes a ‘dialectical problem’ as something ‘useful’ for theoretical studies and arts such as ethics, natural sciences and *logikē* in I11 and 14. So understood, the spheres of dialectical practice and of *logikē* practice are different, although neither is confined to particular sciences. I shall argue that (a) the method exhibits the *logikē* method concerning how one ought to say about terms, predications and arguments on whose basis one can analyze any argument including both those used in dialectical as well as philosophical practices.

Aristotle argues that dialectical problems contribute to theoretical problems which are [x] ethical (*ēthikai*), [y] natural (*phusikai*) and [z] *logikai*. While Aristotle distinguishes types of propositions and problems in I11, he separates corresponding arts and studies in I14. In I11, he says as follows, where I symbolize ‘dialectical problems’ which come about according to their relevant subjects or issues such as action and knowledge respectively as e.g., [x’] (with apostrophe) and the subjects or issues with which they are concerned as [x];

A dialectical problem [[x’] [y’] [z’]] is a speculation that leads towards (*to sunteinon*) either to [x] choice and avoidance, or to [y] truth and knowledge (*pros alētheian kai gnōsin*), or, either by being [z’] itself or as a working together [with [x’] [y’]], to [z] something other than such [x] [y] things (*ti heteron tōn toiūtōn*), of [z] which (*peri hū*) either people hold no opinion either way, or the masses hold a contrary opinion to the philosophers (*tois sophois*), or the philosophers to the masses, or each of them among themselves. Because [x’] some of [dialectical] problems are useful (*chrēsimon*) to

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8 Most, [Endoxa] p.187.

know (*eidenai*) with a view to [x] choice or avoidance, e.g. whether pleasure is to be chosen or not, while [y'] some are useful to know (*eidenai*) merely with a view to [y] knowledge, e.g. whether the universe is eternal or not: [z'] others, again, are not useful by [dialectical problems] themselves (*auta kath'auta*) for either of these [x] [y] purposes, but yet work together in regard to [z] some such problems (*tina tōn toiūtōn*); for there are many things which we do not wish to know by themselves, but for the sake of other things, in order that through them we may come to know something else (104b1-12).

While [x'] [y'] [z'] indicate dialectical problems, [x] [y] [z] indicate their corresponding subjects or issues such as action and knowledge. A dialectical problem is one which 'leads (*sunteinon*)' to [x] ethical choice in action or to [y] natural knowledge by grasping truth or to [z] 'something other than such [x] [y] things', although it [z] encompasses 'some such problems [x] [y]'. [z] means those things which bring about the knowledge with which 'philosophers' are concerned, just as people who are concerned with ethical and natural sciences respectively produce action [x] and natural knowledge [y]. [z] should be taken to signify some theoretical study or art or proposition. Although he did not use the name of [z] in I11, the passage shows that it is related to ethical and natural problems, covering both value and knowledge terms. As we shall confirm in I14, [z] signifies something which brings about a cognitive state or ability called '*logikē*' which is 'something other' than the cognitive abilities required for action and natural knowledge. Dialectical problems are 'things which we do not wish to know by themselves' but are 'useful' for the knowledge of issues [x] [y] [z] (104b6). In fact, the dialectical problem is said to be 'useful' for 'sciences according to philosophy', 'because we who are able to puzzle on both sides of a subject will detect more easily the truth and error about in each subject' (I2.101a34-36). Thus [z] appears to point to the object of philosophical knowledge which falls under such matters as [x] [y]. Dialectical practice is undertaken when there are controversies at the level of opinion and thus is useful for those theoretical studies and arts by itself or with the aid of knowledge in other areas (cf.104a15).

Aristotle gives examples in I11 which enables us to grasp what *logikē* is. He contrasts 'the *thesis*' held by philosophers with reputable opinion. The thesis is described as 'a paradoxical judgment of someone among people who know according to philosophy' (104b19). A paradoxical judgment by eminent philosophers is against reputable opinion, because 'people hold no opinion' due to the peculiarity of the thesis. This [z] has a philosophical characteristic in that either no one has an opinion either way or it is hard to gain agreement between the masses and the philosophers. Examples are 'counterargument (*antilegein*) is impossible' and 'all things are in motion' and 'Being is one' (104b19-26). Eventually, these 'theses' will become 'almost' dialectical problems (104b35). Dialectical problems do not come to exist naturally and by themselves. Philosophers make use of dialectical practices to gain knowledge of such things as 'counterargument', 'movement' and 'being' in order to construct the art of argument, physics and ontology in a *logikos* fashion of how one ought to say.

In *Topics* I14, the expression '*logikē*' is introduced by comparison with theoretical studies in terms of the characteristics of their relevant propositions. In the first appearance of '*logikē*' in I14, Aristotle raises, 'in outline' three divisions of propositions and problems; 'some are [x-p (roposition)] ethical propositions (*ēthikai*)', some are [y-p] natural (*phusikai*), while some are [z-p] formal propositions (*logikai*: plural of *logikē*)' (105b20). This is where, in my view, Aristotle introduces this concept '*logikē*'. An example of general or formal problems, is such as 'Is the knowledge of opposites the same or not?'

In *Topics* I14, Aristotle continues his discussion by considering ethical, natural and *logikai*

propositions.

For the purpose of philosophy we must treat of these things [[x] ethical, [y] natural and [z] *logikai*] in accordance with truth, but dialectically ([x'] [y'] [z']) in accordance with opinion. All propositions should be taken in their most universal form; then, the one should be made into many. E.g. [z-p] 'The knowledge of opposites is the same'; then, 'The knowledge of contraries is the same', and 'of relative terms'. In the same way these should again be divided, as long as division is possible, e.g. the knowledge of [x] good and evil, of white and black, of [y] cold and hot (105b25-37, cf.403a2).

This passage enables us to understand the relation between dialectic and '*logikē*'. There are similarities between problems which can be addressed philosophically and dialectically. In I11, we saw that dialectical problems [x'] [y'] and [z'] are directed to three groups of non-dialectical issues [x] [y] and [z]. Among dialectical problems in I11, as these examples show, [x] choice and avoidance corresponds to ethical problem and [y] truth and knowledge corresponds to natural ones. It is reasonable to take [z] as intended to correspond to '*logikē*', the study of universal and formal terms and sentences. Aristotle says that 'I call it [the proof] '*logikē*' because in so far as it is more general it is further removed from the appropriate principles [in particular sciences]' (GA. II8. 747b27-30, cf. 86a23). As a result of this characteristic, '*logikē*' proof should not be applied to such natural problems as why the mule kind is sterile due to its being 'too general and empty', just as natural proof should not be applied to logical issues (748a8).

It is important to note that propositions in the three groups are either employed in philosophical activity to grasp knowledge or dialectically to submit *pro* and *con* arguments when examining a thesis at the level of opinion. These two undertakings differ in their 'direction of ability' concerning one and the same thing: 'Of things which dialectic is critical (*peirastikē*), philosophy is knowledge-producing (*gnōstikē*)' (Met.IV2.1004b23-25). When ethical and natural propositions are considered 'in their most universal form', they are addressed in *logikē* or *dialectikē*, which can offer philosophical or dialectical information discussed in areas beyond the genera with which particular sciences are concerned.

So understood, any proposition or problem containing universal and formal terms is a *logikē* one. For instance, the claim that [z-p] 'the knowledge of opposites, contraries is the same' implies that a *logikē* proposition is applied both to [y] 'hot and cold' in the dimension of natural science and [x] 'good and bad' in ethical study, and thus is a universal encompassing both natural and ethical propositions. This type of proposition is being applicable to particular sciences either dialectically or philosophically. Nothing hinders a scientific researcher from using a dialectical approach in offering a pair of contradictory views on the basis of reputable opinion in order to gain knowledge of their truth.

On the basis of the types of propositions and problems distinguished in I11, Aristotle separates corresponding arts and studies in I14. Just as accumulations of natural and ethical propositions form natural and ethical sciences, *logikai* propositions (the language network of which is formed by thoughts using universal terms such as 'same' and 'opposite') can be understood as parts of some theoretical discipline or art. From this occurrence of '*logikē*' suggests the translation, together with the noun 'art (*technē*)': 'the art of formal constructive argument'<sup>9</sup>.

It is not by coincidence that 'astronomy (*astro-logikē*)' and 'theology (*theo-logikē*)' are accompanied

9 There are two more occurrences of this word with the adjective use of *logikē*, -os in the *Topics* which are coherent with my readings of the term (129a17-31, 162b25-28, cf.88a28.b14, 1027b18-31).

by the suffix '*logikē*' (46a19, 291b21, 1026a19). Since their objects, such as the stars and God, are difficult to observe, they cannot be conducted without appealing to arguments with universal terms (290a29, 1072b28-30, 1073b1-8, 258b12). Theology is focally structured by the universal ontology as the first philosophy, while astronomy deals with such issues as the eternity and infinity of universe (cf. 1026a18-32). The introduction of *logikē* in I14 is carried over to universal ontology and thus theology.

The *logikē* method is ultimately based on the logical and ontological principle of non-contradiction, 'the most steadfast principle of all principles' (1005b16-23). Aristotle intended to offer a universal art of argument in this project. As the founder of logic, Aristotle developed *logikē* as the theoretical part of dialectic in which he engaged in the basic part of reasoning which leads to logic.

## VII. Origin of the Syllogism

Aristotle's (a3) *topos* theory in the *Topics* which discusses various logical issues contributes to the formation of logic. I shall call the ingredients of logic such as logical necessity, (a4) 'logical ingredients' based on (a1) (a2) and (a3). These concepts are *logika* ones, because they concern formal and general issues in which only philosophers are interested. On the basis of some parts of his *topos* theory, Aristotle formalized the theory of syllogism, making use of the mathematical practices in the Academy such as Eudoxus' theory of proportion (cf. Euclid, *Elementa*, V1). Eudoxus is reported to have taken the view that the shortest proportion (*analogia elachistē*) consists in three terms which can be identified with Aristotle's 'continuous proportion' such as  $a:b=b:c$  (1131a31-b5)<sup>10</sup>. Also symbols such as 'A' and 'B' which are introduced as variables contribute to the formalization of syllogism.

It has been shown by scholars how and in what way *topos* theory and mathematics in the Academy contributed to the syllogistic theory<sup>11</sup>. I shall merely mention, as examples, parallel passages on logical matters in the two undertakings<sup>12</sup>: (1) the theory of square of opposition, (2) *Dictum de omni et nullo*, (3) conversion, (4) *reductio ad impossibile*, (5) logical necessity, (6) begging a question, (7) true conclusion from false premises, and (8) the necessity of one universal affirmative for a syllogism to be valid. These *topoi* are found not only in the passages where Aristotle discusses 'how every syllogism comes about' but also in the passages in *Prior Analytics* I27-46, II. In these passages, Aristotle seeks to gain 'power-ability to produce syllogisms', that is the ability to find the starting-point as a premise of the conclusion which was already given (cf. I26.43a16-24).

Aristotle has devised and created (a4) logical space through the formalization of the possible relations of three variables by examining their combinations in terms of the quality (affirmation and negation) and quantity (all and some) in the premisses with regard to the combination of conclusion logically necessitated. The syllogistic theory involving (a4) figures and moods in *Prior Analytics* I4-22 is an extension of (a1) (a2), the core part, and an extension of and/or parallel with some additional parts of (a3)

10 Einarson II [Logic], p.155. Szabó. Á, [Mathematik] S.216.

11 M. Kneale says that 'there are many passages in the *Topics* which anticipate points in Aristotle's syllogistic'. [Development] p.36. Einarson, [Logic] I, pp.33-54, II, pp.151-172. Á. Szabó, [Mathematik] S.238.

12 (1) *T* (op).II1-2, 120b15-21, V6: *A* (*n.Pr*).I4.26b14-16, 15.27b21-22, 146.52a39-b13. (2) *T*.109a3-7: *A*.24a18-20. (3) *T*. e.g. 109a10-26, 131b38-132a9, 135a9-19, 140b16-27, 163a32-35: *A*.25a1-13, 25a27-29. (4) *T*. e.g. 120a8-10, 157b35, 165a2:A.41a21ff, 61a18. (5) *T*. e.g. 100a26, 111a33-38, 111b17-23: *A*.24b19, 25b38. (6) *T*. e.g. 162b31-33: *A*.III6. (7) *T*.162b22-25: *A*.II2-4. (8) *T*.164a10: *A*.41b6.

the *topos* theory such as *topoi* (1)-(8) in the *Topics*, as well as of some mathematical devices contributing to the calculation of logical validity (cf. *An.Pr.*I30). When Aristotle was involved in (a3) the *topos* part of the method, which is supposed to be combined with mathematical formalization, he seems to have embraced the idea of a system of formal valid argument with a minimum of three variables. Since he is constructing the logical space for the first time in human intellectual history, these minimal ingredients are sufficient and appropriate for his project (cf. 44b6-7).

Now Aristotle defines the syllogism as follows: ‘Syllogism is an argument in which, certain things being laid down, [s2] something other than these things follows [s1] by necessity [s3] on the basis of these things being so’ (*An.Pr.*I1.24b18-20, *Top.*I1.100a25-27 [[s3] through these things]). In *Prior Analytics* I4-22, Aristotle clarifies how ‘to theorize the generation of syllogisms (*tēn genesin theōrein sullogismōn*)’ under the question of (a4) ‘how every syllogism comes about’ (I26.43a16, 27.43a24). Any kind of argument which satisfies conditions [s1]-[s3] is valid, where these criteria are proposed in the ‘perfect’ syllogism i.e. syllogism *simpliciter* in I4-22. I construe that by introducing the syllogism *simpliciter* to which all other syllogisms in general should be reduced, Aristotle here sets the strictness condition of every demonstration and every syllogism (cf. 40b17-25). In other words, the syllogism *simpliciter* is the minimum syllogism which satisfies the conditions [s1]-[s3]. Therefore, the syllogism *simpliciter* offers the basic criterion according to which the validity of all other syllogistic arguments are judged. He argues for that there are only fourteen valid moods in three figures (I23.41a13-19). This part of the *Prior Analytics* which consists of only 19 chapters opens a new space called ‘logic’.

‘Syllogism’, then, is characterized by two levels, i.e. by a criterion generating valid syllogisms and by soul’s proving power-ability which is accompanied by a cognitive state of conviction for the practitioner (cf. 67a37). The first level which is founded on (a) ((a1) (a2) and (a3)) can be described as (a4) ‘*logikos sullogismos* (formal syllogism)’ (93a15, 1355a13, cf. 43a16-24). At this level, Aristotle is merely concerned with ‘how syllogisms come about’ in the *logikē* fashion, leaving aside epistemological issues such as how to secure the premises needed to prove the proposed thesis. Demonstrative and dialectical syllogisms belong to the second level (cf. I1.24a22-28). While (a4(dem)) a demonstrative premise is true and assumed on the basis of the first principles of the relevant science, it is (a4 (dia)) a dialectical premise either if it asks for a choice between two contradictories, or if it assumes what is apparent and reputable (*Top.*I1, *An.Pr.*I1). It is important to note the connection between the theory of how syllogism comes about and (a3) the theory of *topos* in the *Topics*. While the *topos* theory in the *Topics* provides the *loci* (places or points) for establishing and overturning a single proposition, in *Prior Analytics*, it is mainly concerned with when a syllogism is valid; Aristotle mentions a *topos* on this issue that ‘it is not possible to establish universal conclusion by means of particular, though it is possible to establish particular conclusion by means of universal. At the same time it is evident that it is easier to refute than to establish’ (I26.43a13-15). I conjecture that Aristotle gave lectures in the Academy on these two genera of *topos* almost in the same period of time, dividing his labor between the two, and collected these *topoi* inductively such as (1)-(8). The accumulation of these *topoi* led to the birth of logic. When Aristotle remarked, concerning the discovery of logic, that ‘we were kept at work for a long time laboring at tentative researches’ in the last chapter of *Topics*, he seems to have been working on *topoi* concerning propositions and syllogisms as well as searching for a way of mechanical operation of logical calculation partly derived from mathematical theories (IX34184b3).

He eventually found out that a syllogistic theory which conveys the logical necessity in deduction is

far more powerful than what Socratic informal deduction by dialogue. This is why he reported his somewhat surprising discovery together with his satisfaction as an unforgettable event in *Topics* IX34: 'The task, then, which we undertook is sufficiently completed. But we must not fail to observe what has happened (*to sumbebēkos*) regarding this undertaking' (183b15-16). By 'what has happened' which implies an incidental event, I think, Aristotle seems himself to be surprised at the formidable strength of his theory. While he developed logic as a *sui generis* discipline by introducing the syllogism *simpliciter* within his general project of dialectic, this was an outcome which was hard to predict but, once established, became an indispensable art of argument (40b20, 41a5). Aristotle reflected that 'whereas concerning the subject of syllogizing (*peri tū sullogizesthai*), we had nothing else of an earlier date to speak of at all' (184b1)<sup>13</sup>. Logic that is *logikē* art in a *logikos* fashion came into existence while he was devising (a) the method of dialectic as the background theory underlying dialectical practice.

Now someone might raise a chronological difficulty whether Aristotle had a general plan of *logikē* art on the basis of (a1) -(a4) from the beginning or he achieved a general result as an accidental outcome of the more limited endeavor setting out a theory of dialectical practices. In reply to this query, I would point to his reflection (above mentioned) that since Socratic dialectic was not strong enough to grasp the essence of a thing, Aristotle's project was to strengthen the art of argumentation under the name of 'dialectic' in an extension of Socratic tradition called 'second journey' from the beginning of his career in the Academy. Following Socrates who tried to say only steadfast things, he devised step by step his new theory of terms and predications, of *topoi* and thus of syllogism in the *logikōs* fashion. However, he found his syllogistic theory to be so powerful as an art of argument that it became the underlying method for every theoretical study.

My reply, partially endorses both views. While Aristotle expected his method of dialectic to provide a formal system to grasp Socratic essence by saying only steadfast things in the Academy as a follower of Socrates, he ended up creating several related but relatively independent disciplines such as logic and demonstration, all of which contribute to demonstrate what a thing is.

## VIII. Retrospect on what has been achieved in dialectic

What Aristotle intended to invent was a method of dialectic: 'The project of this undertaking (*tēs pragmateias*) is to invent (a) a method (*methodos*) whereby (b) we shall be able to (*dunēsometha*) syllogize

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13 Barnes takes this to be the discovery of theory of deduction including dialectical syllogism but not the syllogistic figures, moods. Barnes says that 'The characteristic terminology of Syllogistic is entirely absent from the *Topics*; here there are no moods and figures, ...no conversions..no reductions' [Proof] p.47. It is not accurate, however, to say that there are 'no conversions..no reductions', as we saw (3) and (4) and others in parallel or at least heralding descriptions (1)-(8) on the 'Syllogistic technique'. Absent of using symbolism such as variable in the *Topics* can be explained by his editorial plan of his treatises on the art of argument in general involving at least the whole *Organon*. In his reflection in *Topics* IX 34, however, Aristotle summarizes the whole history of the development initiated by Tisias and mentions his new device of syllogistic theory (I4-22) as a whole. Without the syllogistic theory, his overall project of constructing art of argument is not completed.

In connection with this issue, Maier-Barnes chronology on the *Organon* is hard to accept. By appealing to the absence of the word 'syllogism' in the *topos* theory, for instance, they put II-VII2 before I (p.44. n.43). But it is impossible for Aristotle to develop the *topos* theory according to each predicable in order without having established the theory of four predicables in the core part I4-9.

from reputable opinions (*endoxōn*) about every problem proposed, and (c) also we will not say anything conflicting, when submitting an argument ourselves' (100a18-21). However, the range of 'the project of this undertaking' is not clear. Does it contain not only the division-based but also the demonstrative syllogistic power-abilities (*dunameis*)? He was negative about the possibility of syllogizing what a thing is by division, which he viewed as 'a weak syllogism' due to its disjunctive character of procedure and its question begging nature. Nevertheless he sought to fit it into his system based on demonstration (*An.Pr.*, 131, 31-37, *An.Post.* II5).

Since (c) is generally stated, I shall immediately quote the last passage of this undertaking in *Topics* IX34 in which Aristotle considered what he has achieved in this project. Since this chapter reflects the whole history of art of argumentation since Tisias, Aristotle edited this chapter at the last stage of his work on dialectic. I shall seek to show that (c) is the result of the whole undertaking with respect to what and how much 'as the person having knowledge (*hōs eidōs*)' involves. Part of Aristotle's view is as follows;

We have intended, thus, to invent (a) (=a4 based on (a1)-(a3)) some syllogistic power-ability (*dunamin tina sullogistikēn*) about any problem put before us from (a4(dia)) the most reputable opinions (*endoxotatōn*) that there are. For this is (b) a practice of both dialectic in itself and the art of examination (*peirastikē*). Since (a4 (dem)) a power-ability is additionally equipped (*proskataskeuazetai*) with [syllogistic power-ability] itself, such that a man is able to conduct an examination not only (b) dialectically (*dialektikōs*) but also (c) as the person having knowledge (*hōs eidōs*), due to its being the neighbor of the art of sophistry, we therefore proposed for our undertaking not only (b) the aforesaid task of being able to examine an argument of any view, but also (c) how we shall defend our thesis in submitting an argument in the same manner [dialectically] by means of the most reputable opinions' (IX34.183a37-b6 [183b1-2: Following not Ross but Bekker: *proskataskeuazetai..hōst' ū monon*])<sup>14</sup>.

Aristotle's own claims about his undertaking from the perspective of man's intellectual ability 'to invent (a) some syllogistic power-ability (*dunamin*)' correspond to the sentence exhibiting a dialectical practice (b) 'we shall be able to (*dunēsometha*) syllogize from reputable opinions about every problem proposed' in II. This power-ability is required for (a4 (dia)) dialectical syllogism which is 'dialectically' carried out by offering one or other of a pair of contradictory claims in the realm of opinion. Aristotle intended to delineate that power-ability by criticizing both sophists' apparent syllogistic faculty and Socratic dialectic. The method (a) is designed to train Academicians by performing (b) and (c). Their training is conducted under the guidance of (a) the method. Insofar as the dialectic at work is (b) peirastic, a dialectician is not required to know the relevant thing.

Since this characteristic resembles the type of activity in which the sophists engaged, Aristotle requires his students to use as premises only more powerful premises: 'the most reputable opinions that there are' by employing the superlative characteristic to the opinion. How does one ensure that one's

14 My translation 'as the person having knowledge (*hōs eidōs*)' is supported by Poste alone. He translated 'professing not only to test knowledge with the resources of Dialectic, but also to maintain any thesis with the infallibility of science' [Fallacies] p.93. Many like Dorion ([Refutations] p.411), Forster ([Refutations] *ad.loc*), Pickard-Cambridge ([Topica] *ad.loc*), Tricot ([sophistiques] *ad loc*) simply take it to mean 'pretence' or 'show' of knowledge. Grote changes the subject of knowing to the defender by supplementing unnecessary words '*alla kai hupekein* (or *dūnai*) *hōs eidōs*' [Aristotle] p418, n.c. Similarly, Dorion thinks that 'Aristotle, in fact, exhorts a defender to defend his thesis *as if* (comme si) he knows' [Refutations] p.411.

dialectical premises are the most reputable opinions? Aristotle is justified for this claim when some other power-ability i.e. demonstrative one which is compatible with the division-based syllogistic power-ability is added to the dialectical power-ability. This is because 'the person having knowledge' will be able to put forward the most reputable opinion. Since Aristotelian dialectician is supposed to examine opponent's thesis by 'having knowledge', the person who knows the relevant thing can in general put the premise as the most reputable opinion in the sphere of opinion.

I shall call the kind of dialectical practice according to 'dialectic in itself and peirastic' as (b) 'genuine dialectic'. By contrast, I shall label the kind of dialectical practice in which dialectician can be characterized as (c) 'as the person having knowledge (*hōs eidōs*)' and/or able to defend his thesis by means of the most reputable opinions as 'dialectic *ad hominem* with knowledge' or 'dialectical practice by suspending the use of knowledge'. The accuracy of these labels will be confirmed in what follows.

Aristotle decisively differentiates the Aristotelian dialectician from the sophist by adding to (b) *peirastic* practice the task (c) submitting one's own coherent argument *as* being knower. This is shown by the explanatory statement; 'due to its being the neighbor to the art of sophistry' (183b1). A sophist too may examine everything and refute everything. While (a4 (dia)) the dialectical syllogism is supposed to be based on the *most* reputable opinion, it should be ideally proposed by a person who has knowledge of the relevant thing. By the end of his undertaking, Aristotle could claim to have an additional system of producing knowledge which is compatible with the division theory is equipped as well. In VII3, as we saw, he refers to 'another accurate undertaking' in the *Posterior Analytics* for a detailed discussion of the syllogism of essence (153a14, cf. *An.Post.II8-11*)<sup>15</sup>. We should say that Aristotelian philosopher uses his syllogistic power-abilities for both (b) and (c) either as a dialectician or as a philosopher.

In describing (c), Aristotle states that an Aristotelian dialectician is supposed to know the relevant thing (in the way in which he develops the syllogism of essence in his *topos* on the defining-phrase). Therefore, Aristotle nurtures philosophers rather than just dialectician through his method of dialectical training. Aristotle designs his *theory* of dialectic to enable him to develop a system of producing knowledge such that anyone is designed to enable him to develop the system of producing knowledge so that anyone trained in the Aristotelian art of argumentation can act both as a philosopher and as a dialectician equipped with a meta-theory which can be used for a variety of different purposes.

Aristotle's distinctive claim is that a philosopher who (c) knows the relevant thing can dialectically submit a thesis as a dialectician by temporarily suspending his knowledge and conceding to his interlocutor. Aristotle searched for a comprehensive theory to meet Socrates' objective <1> knowledge of what a thing is with skills <2>-<4>. Socrates usually refutes views by leading his opponent to express a view which contradicts with his original thesis. For this reason Socrates would agree with both goals (b) and (c) of Aristotelian dialectic.

Aristotle claims he and his colleagues are situated between the sophist who pretends to know and Socrates who does not know. He continues his reflection as follows; 'We have stated the reason of *this* [claiming (c), by being additionally equipped with the power-ability of having knowledge], since Socrates also for this reason [i.e. in order to know] used to ask questions but never answered them, because he used to confess that he did not know' (183b6-8). Aristotle here claims that he has shown how to gain knowledge, an antidote both to the sophists and to Socratic ignorance. Since Aristotle is aware of the

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15 See in detail Chiba [Heuristic].

difficulty in understanding this power-ability for (c), he refers to the texts concerning this additional knowledge-producing faculty, reminding us that Socrates sought for knowledge without success. In my view, *pace* many commentators, in his remark ‘we have stated the reason of this’, Aristotle refers to his discussion in I14 where he introduced the art of *logikē* and also to his theory of demonstration in the *Posterior Analytics* and some other texts (cf. *Top.*I11-14, 105b30-37, 153a6-15, 155b15, 159a25-37, 165a19-27, IX11, 12)<sup>16</sup>. In fact, he characterizes a philosopher as equipped with demonstrative skill in *Topics* VIII1, where he reminds that ‘Philosopher’ is the man who employs ‘the knowledge producing syllogisms’ (155b15). ‘Demonstration’ and its related issues are discussed in the *Topics* 18 times (e.g., 100a27, 141a29, 158a36, cf. TLG ‘*apodeixis*’). While the undertakings entitled *Organon* are mainly ordered and allocated by their subject matters at his editorial stage, this need not imply that they were developed at different periods of his career. A result of one undertaking can be used for others.

Aristotle, as a member of Academy, taught dialectic or peirastic under the guidance of Plato to his students. In fact, in his reflection chapter IX34, Aristotle mentioned his five predecessors such as Thrasymachus and Gorgias, without including Plato. Instead, he employs the first pronoun ‘we’ which refers to Academicians. Aristotle must have regarded (c) as an authentically Academic faculty. Since Aristotle *formally* introduced ‘what it was to be’ in the *logikē* fashion as the goal of successful defining practice in the *Topics*, he is not committed on the question of whether knowledge produced by the method of dialectic involves a supersensible realm as it did for Plato (cf. 1041a28).

## IX. Compatibility between dialectical and philosophical practices

In order to support my interpretation that the added power-ability is the demonstrative one or some knowledge-producing faculty in *Topics* IX34, I will consult other relevant passages. Aristotle considers the compatibility between dialectical practice and philosophical practice. He says in *Topics* I14 that ‘For purposes of philosophy they [ethical, natural and formal propositions] should be dealt with in accordance with truth, but dialectically in accordance with opinion’ (105b30-31, cf. 43b8, 46a10, 65a37, 1004b23-25). It seems that one and the same thing can be the subject of philosophical and dialectical activities.

In *Posterior Analytics* I33, Aristotle discusses whether it is possible both to know and to opine the same thing. He asks ‘in what sense, then, can the same thing be the object of both to opine and to know (*doxasai kai epistasthai*)? Why will not the opinion be knowledge, if one posits that it is permitted to opine everything that one knows?’ (89a11-13). In one passage, he appeals to a criterion in which these two cognitive states of mind are divided by whether one grasps the necessity of a thing or not. If one grasps it in the way in which ‘a man obtains definitions through which demonstrations comes about’, he knows it. On the other hand, if the way of a necessary attribute’s being inhered in a subject ‘does not belong according to substance and form’, he possesses opinion but not knowledge (89a16-21). The same person can know and opine the same thing in these two ways in different contexts. The doxastic state is offered to an opponent as a concession to one who cannot constitute demonstrative knowledge. There is no contradiction here, since the perspectives according to which ‘the same thing’ is considered are different. Aristotle confirms this by saying that ‘It is clear, thus, from these things that one cannot opine and know the same thing simultaneously’ (89a37-38).

16 Waitz [*Organon*] (Poste, Tricot): 165a25ff *ad.loc.*, Dorion: IX17.175a31-35 (p.411).

Likewise, Aristotle's discussion of the two senses of priority and intelligibility in *Topics* VI4 endorses the view that the person who knows can act dialectically by suspending his knowledge of the relevant area. This chapter presupposes some discussions of demonstration in the *Posterior Analytics* as indicated by 'just as in demonstrations' (141a29). Dialectic is doomed to be *ad hominem* because it is activated 'as occasion requires (*hōs an dokē sumpherein*)' (142a7, 13, 33, cf.141a29-a35, b5-8, b23-25).

Further, 'dialecticians' are contrasted with 'philosophers' in *Topics* VIII1 regarding the addressee whether his argument is 'directed to someone else (*pros heteron*)' or 'to himself (*heauton*)'. Since another party is involved in dialectical debates, the issue of 'how one ought to ask (*pōs dei erōtān*;) ' in terms of 'the arrangement and devising questions' matters for a dialectician (155b18). On the other hand, a philosopher who employs 'the knowledge-producing syllogisms' is concerned not with these matters but with whether 'the axioms are most intelligible and as close to the question in hand as possible' (155b14-1). It is said that 'Now, up to the point of finding *topos*, the inquiry of philosopher and of dialectician proceeds in a similar manner ... The source [(a1) (a2)] from which one has to grasp *topoi* is already said' (155b7, b17). In this distinction of their roles, nothing prevents from one and the same person being both philosopher and dialectician in different purpose and context, as long as the core part of dialectic (a1) (a2) and the instrumental part (a3) *topoi* and (a4) syllogism have been grasped by the relevant person.

Some parts of method (a) are Aristotle's device for philosophical inquiry into 'what it was to be F' which Socrates sought for in his ill-fated 'What is F?' question. When Aristotle reflected on this project at his editorial stage, expressing his satisfaction at what he had achieved at the end of *Topics* IX, he had (in my view) established a method for grasping what it was to be, including a demonstration of necessary properties through the what it was to be in *Posterior Analytics* III1 (94a20-36, 183a35). This is why, a person who mastered the method can perform 'dialectically as the person who knows' (183b3). We can call method (a) the 'meta-theory of dialectic', insofar as it is developed from the dialectic initiated by Socrates. Nevertheless (a4 (dem)) the knowledge-producing syllogistic faculty can be more properly called apodictic (*apodeiktikē*) based on *logikē* faculty. I shall examine how the Aristotelian *logikē* art is employed in his ontology.

## X. *Logikē* Formation of Ontology

In *Metaphysics* VII-IX, beginning with a preliminary work of how one ought to say about what substance is, Aristotle seeks for substance which is 'knowable by nature (*ta tē pusei gnōrima*)' by developing his universal ontology involving the theories of matter-form and modal being (cf.1019a2, 1029b5). In his definition of 'nature', he identifies the internal principles of motion and rest in natural things both as 'the primary underlying matter (*hē prōtē hupokeimenē hulē*)' and 'the form according to the account (*to eidos kata ton logon*)' (*Phy*.III.193a29-31). Since forms such as the soul are not observed by perception, but identified through the formation of a unified account of the composite entity with a part 'separated in terms of account (*tō logō*)' from its material part, the form is qualified as 'according to the account (*kata ton logon*)' (cf.1032a23, 412b10, 1042a19). These two natural causes are regarded to be substances in the natural and metaphysical levels, ordered with respect to their priority in terms of being (VII3.1029a5-7). This is because matter is indefinite 'in itself' and made definite by the relevant form in terms of account (VII3.1029a20, cf.V4.1015a3-5).

Matter is in itself indefinite, because it does not belong to any category of entities (CE). Just as any

substance term does not occupy the place of predicate which is predicated of the subject as the attribute term because it does not produce any significant sentence such as ‘White is man’ in which ‘man’ does not signify what white is, nor how much white is and so on, matter is not dealt as the predicate. Nevertheless, matter satisfies the underlying-ness condition for being a substance, since ‘other attributes are predicated of substance and substance is predicated of matter’ (1029a23). Matter is regarded by materialist to be the only substance because of its underlying-ness (1029a18-27). But it fails to meet the other two conditions for being a substance; the ‘separate’ independent condition and the ‘some this’ referential condition (1029a26-28).

I here simply point to some reasons why these two conditions can be met by form; Form is ‘separated’ from matter ‘in terms of account (*tō logō*)’. Form is at work as ‘shape (*morphē*)’ of composite and carries the definiteness ‘in virtue of which a composite thing is said as ‘some this’’ (VIII2.1042a29, *De An.* III. 412a8, *De Caelo*, 277b32). The separation in account and the non-separation in the composite’s being at-work in the *ergon* dimension here and now do not contradict each other. As a result of ‘double reference (*ditton sēmainein*)’ in living things, both ‘the soul [form] of Socrates’ and ‘Socrates [as the composite (*hōs to sunolon*)]’ can be simultaneously referred to by ‘Socrates’ as something inseparable with matter and as an account separated from matter (1037a8, 1031b23, 1042a26-31, 1043b3). Furthermore, while ‘this (*tode*)’ accompanied by ‘some (*ti*)’ is stated in a general context of referring indefinitely to such a particular thing as Socrates or Callias, ‘this’ alone is employed in a concrete context of referring to, say, Socrates here and now (cf. 417a29, 1032b19, 1037b27, 1048b8).

In *Metaphysics* VIII, 3-6, Aristotle investigates being with explicit methodological awareness. It is widely agreed that these chapters are discussed from the *logikē* perspective<sup>17</sup>. I shall make explicit that the initial stage of inquiry into being in these chapters is carried out by the same method as the *logikē* formation of dialectic in the *Topics*. We will see how the method (a1) (a2) of terms and predications works as a method of ontology in his inquiry into ‘how one ought to say about ‘being’.

In VIII, through the analysis of being under the categories of predications (CP) and of entities (CE), the study of being is focally structured by the study of what the substance is (1028b4). He remarks about the focal structure of being that ‘Substance is primary in every sense—in account and in the order of knowledge and in time. For of the other categories none can exist in separation, but only substance’ (1028a33). As we saw in section IV, the asymmetry of substance and attributes is simply established through the analyses of both ‘of-itself’ and ‘of-other’ predications in (CP) the category of predications. When Aristotle says in VIII that ‘being signifies (S1) what a thing is and (S2) some this’ (1028a12), he has the dual function of signification in (CP) identifying a linguistic act in *Topics* 19 in mind (cf. sec. IV (S1) (S2))<sup>18</sup>.

In VIII3, Aristotle enumerates four abstract entities in which a substance term can be found; ‘The word ‘substance’ is said most of all, if not in more ways (*pleonachōs*), at least in four [ways]. This is because the what it was to be, and the universal, and the genus seem to be substance of each thing, and the fourth is

17 Burnyeat, [Map] p.6, 14.

18 Ross fails to see the dual function of signification, by allocating ‘the ambiguity’ between ‘essence (*ti esti*)’ and ‘individual (*tode ti*)’ to the distinction of ‘secondary substance’ and ‘primary substance’ in the *Category* as well ([*Metaphysics* II] p160). Since Aristotle introduces the category of predication (CP) based on the theory of predicables in *Top* I8-9, it is at least certain that the book *Category* is written later than *Top*.I.

the underlying of these' (1028b33). Thus the word 'substance' seems to be employed at least in these four entities. These four ways of qualifying 'substance' are derived from his method (a) in *Topics* I.

Four kinds of substance term are found, for instance, in a *Topics* type 'of-itself predication': 'Man [subject=underlying, universal] is 'rational [genus like (*genikon*)] animal [genus]' [defining-phrase] signifying the what it was to be man' (cf.102a35, 103b35-37, 1038b2-3). In the case of a predicable called '*horos*' alone, the subject and the predicate are interchangeable by satisfying the replacement condition to the effect that 'the defining-phrase as the account signifying the essence is given by an account in place of a name' (15.101b37). Another predicable 'property (*idion*)' does not satisfy this replacement condition, because it is possible for a thing F to have many properties which belong to the thing F alone (cf. 102a18-30). Thus, in order for anything to be a single thing, there must be a single essence (141a35). The singularity of essence is applied to any substance either particular or universal, because the *logikē* discussion does not directly consider by observation how the world is at work here and now (cf.103b29-31). The essence is formally characterized as 'the definable entity (*dunaton.. horisasthai*)' (102a2). The definable entity is introduced in a formal fashion through the analysis of four exhaustive and mutually exclusive possible replies to the 'What is F?' question. Formal notion can be properly discussed and grasped at the formal level and works as a place holder which can be filled by a correspondent natural and metaphysical entity.

Aristotle investigates the substance as essence in *Metaphysics* VII4-11, by saying that 'First let us say something about essence in a formal argumentative fashion (*logikōs* (adv.))' (VII4.1029b13). In his methodology, Aristotle followed Eleatic tradition by setting up the *logikos* fashion of thought by addressing questions such as 'how one ought to define (*pōs dei horizesthai*., *pōs horisteon*;)') (*Top.*VII3, 153a12, *Met.*VII.1026a4). Aristotle explains the essence in a *logikos* saying that 'We will say..that the essence for each thing is the one which is said according to itself. For to be you is not to be musical. For you are not musical according to yourself' (VII4.1029b13-15). In this way, the *logikos* argument does not give any piece of information about the natural world but can distinguish the essence i.e. substance 'to be you' from the attribute 'to be musical'. It also can make an ontological claim about being one and about the existence of the single essence required for anything to be one, as when it is claimed that 'To be precisely what something is (*to einai hoper estin*) is single for each of things which are' (*Top.*VI4.141a24, 35-37. *horisteon*: 142a7, 141b25, cf.1007b25-29). In his 'discussions about definition', Aristotle asks 'Why is the account of which we call a definition, one?' and 'Why is this one but not many animal and biped?' (VIII2.1037b11, 13-14). These are examples of his *logikos* pursuit of 'how one ought to define', which serve as a preparatory step towards the soul's cognitive endeavors based on observation.

When Aristotle begins his investigation of form by saying that 'we must inquire into the third kind of substance' at the end of VII3, he immediately takes a steadfast approach of *logikē* (formal) investigation in VII4. Aristotle describes one basic characteristic of *logikē* consideration (*logikōs*) as follows; 'It must be inquired how one ought to say about each thing, but it is at least not more than how a thing is (*dei men ūn skopein kai to pōs dei legein peri hekaston, ū men mallōn ge ē to pōs echei*)' (1030a27). *Logikē* inquiry is placed as a preliminary stage in the general dimension for further heuristic inquiry into the reality 'how a thing is'.

In this chapter, he investigates how one ought to say about such general notions as 'being', 'non-being', 'what it is' and 'what it was to be (*to ti ēn einai=tēe*)'. This is not merely a linguistic analysis. For instance, Aristotle makes an ontological claim of the focal structure of being through a *logikē*

discussion that the essence belongs *primarily* to substance (1030a29). This is because substance is primarily identical with itself as the definable entity. Thus the essence exhibits a condition for any entity to be substance by means of which all other entities are ordered and unified. In fact, the essence is characterized as a *logikē* notion, when it is identified with natural four causes except material cause: ‘this [the cause] is the what it was to be, as to speak in a formal fashion (*hōs eipein logikōs*)’ (1041a25).

I now examine how Aristotle locates form and essence in terms of their intelligibility. Having confirmed the inquiry into the form to be ‘the most difficult’ in VII3, Aristotle then introduces a methodological passage in the beginning of VII4. We find here his description of general characteristic of the method ‘*logikōs*’ in the process of intellectual learning and inquiry. *Logikē* analysis is situated as a first clue to grasp the entirely knowable by nature. The formal term ‘essence’ is discussed in the context of preliminary inquiry into the form, insofar as this formal definable entity is located according to the order of nature. Since the relevant passage is mooted with respect to the location of lines, I shall quote it in full as I think it to be correct, that is, Bekker reading:

[Chapter 3: 1029a32] We must inquire into the third kind of substance [i.e. form]; for this is surrounded by difficulties most of all (*aporōtatē*). But some of sensible things are agreed to be substances, so that we must *firstly* (*prōton*) investigate [form] in these sensible substances.

[Chapter 4: 1029b1] Since we, in the beginning, went through how many ways we mark out the substance [i.e. four] and the what it was to be [*to ti ēn einai (tēe)*] seems to be one of these, we must theorize about it [*tēe*]. [1029b3] For it is effective to proceed [from the less knowable] to the more knowable (*pro ergū gar to metabainein eis to gnōrimōteron*). For [S] learning proceeds for all people in this way through that which is [N1] less knowable by nature [i.e. essence=(*tēe*)] to [N2] that which is more knowable [i.e. form]; and just as in conduct our task is to start from what is *good for each person* and make [N2] what is *wholly good*, good for each, so it is our task to start [a] from [S1]= [S1a]=[N1] what is *more knowable to oneself* [e.g. the meaning of a term] and make [b] [N2] what is *knowable by nature* [e.g. a cause of being] [S1]=[S1b]=[N2] knowable to oneself. Now [S1a] what is knowable and primary for each person is often only [N1] knowable to a very small extent [by nature], and has little or nothing of being (*micron ē ūthen echei tū ontos*). But yet one must start [a] from [N1] that which is barely knowable but [S1a] knowable to oneself [i.e. essence (e.g. to be you)], and must then attempt [S1b] to come to know [N2] what is wholly (*holōs*) knowable [i.e. form], by proceeding, as has been said, [a] through [S1a] those very things which one does know.

[1029b13] *Firstly*, let us say some things in the *logikē* manner (*logikōs*) about it [*tēe*] such that the what it was to be for each thing is what is said in virtue of itself. For *to be you* is not *to be musical* (1029b1-15).

I believe that the whole passage in VII4 quoted describes the placement of method called ‘*logikōs* (in the manner of formal constructive argument)’ in the process of learning. Aristotle takes up the sensible substance such as ‘you’ whose form is inherent as the first object of inquiry and begins its *logikē* analysis by stating ‘what it was to be you’ or in abbreviation ‘to be you’ as a way to make an access to the wholly knowable by nature i.e. the form of ‘you’. I claim that this formal definable entity is less knowable by nature but knowable to each man. Given that the word ‘*metabainein*’ means ‘to pass over from one place to another’ (LSJ), one has to fill two places or items [a] [b] and two times [t1] [t2] ([a]=[t1], [b]=[t2]) in a process. In our case, it is effective for the investigation of substance to proceed or pass over from [a] the essence to [b] the more knowable thing, that is, the form.

Aristotle states that a goal of his ontology is to grasp ‘the most difficult (perplexing)’ (1029a34) substance i.e. ‘form’ at the end of *Metaphysics* VII3. Subsequently, Aristotle introduces ‘the essence’ as a starting point of his inquiry into substance in the *logikos* fashion (VII4 1029b2). He is then engaged in examining ‘what the essence is and how it is according to itself’ in VII4-11 (1037a21-22). Aristotle theoretically considers the essence, ‘because (*gar*)’ it is serving for further inquiry to the form in the composite substance. Aristotle characterizes ‘the essence’ as ‘more knowable for each person’, having ‘little or nothing of being’ (VII4.1029b8-10). This remark is characteristic of the *logikos* approach. ‘what it was to be F’ is originally ‘what Socrates sought for’ in his ‘What is F (e.g., virtue)?’ question and is ‘the thing itself’ being grasped by a successful definition as its answer (cf. *Top.* I9.103b35-4a2, *Nic. Eth.* VII3.1147b14). So understood, essence is a *logikos* concept, a place holding variable to be filled by an entity, such as the form, which satisfies these conditions on what it is to be the essence.

Aristotle makes a general remark about the processes of learning and inquiry so as to locate his inquiry into substance and the nature in a general framework of cognitive activity. Learning is described from both perspectives of [N] *Nature* (knowable in nature) and [S] the *Soul’s* cognition (knowable in us): ‘It is effective to proceed [from the less knowable] to the more knowable. For [S] learning proceeds for all people in this way through that which is [N1] less knowable by nature [i.e. essence] to [N2] that which is more knowable [i.e. form]’ (1029b3-5). In the process of learning and inquiry, [S1] ‘the more knowable for each person’ allows various degrees between [N1]=[S1a] ‘less knowable by nature’ and [N2]=[S1b] ‘more knowable by nature’, where both [S1a] and [S1b] may signify [S1] ‘the more knowable for each person’, as it is said that ‘from [S1a] the more knowable to oneself, to make [N2] the knowable by nature (*ta tē (i) phusei gnōrima*) as [S1b] the knowable to oneself’, on the condition that [N2] ‘more knowable by nature’ can be identical with [N2]=[S1b] ‘what is wholly (*holōs*) knowable’ (1029b10-11). That is, [S1] ‘the more knowable for each person’ varies corresponding to the degrees of knowability by nature between [S1a] and [S1b].

Examples of [N1]=[S1a] are to grasp ‘what a name signifies’ and ‘what the item said is (*ti to legomenon esti*)’ as grasping *sensus literalis* (literal sense) without referring to the world i.e. ‘having little or nothing of being’ (*An.Post.* II10.93b30II.71a13)<sup>19</sup>. Grasping the ‘essence’ as ‘what is capable of being defined’ or ‘to be you’ as something being said ‘according to yourself’ also belong to [N1] what is ‘less knowable by nature’ but [S1a] ‘more knowable for each person’ (*Top.* I5.102a1-2, cf. 1029b13-14, *Met.* VII4.1029b13-15). Aristotle says that ‘Now [S1a] what is knowable and primary for each person is often what is knowable is often [N1] knowable to a very small extent [by nature], and has little or nothing of being (*mikron ē ūthen echei tū ontos*). Nevertheless, one must start from [N1] that which is barely knowable [by nature] but [S1a] is knowable to oneself [i.e. essence (e.g. to be you)], and must then attempt [S1b] to come to know [N2] what is wholly (*holōs*) knowable [i.e. form].’ (VII4.1029b7-10 (following Bekker, disagreeing with Bonitz, Ross and Jaeger who moved VII4.1029b3-12 into VII3). If our inquiry is successful, [N2] will become [S1b]=[N2] when we come ‘to know what is wholly (*holōs*) knowable’. We may then have the knowledge of ‘form’ as the causally basic substance unifying all the necessary elements in the ‘sensible things’ at issue. (1029a34). Value acquisition in human behavior passes the same route as soul’s cognitive process<sup>20</sup>.

The initial *logikē* analysis of learning as having ‘little or nothing of being’ appears to be trivial

19 Concerning the semantic shallowness, D. Charles, [Meaning] pp.1-2, 78-95.

(1029b10). On the basis of his theories of predicables, of category, of signification and of definition developed in the *Topics*, however, Aristotle can put some constraints on and clues for further scientific and philosophical inquiries into the focal structure of being. What a student learns from his teacher at first is how the relevant vocabularies are understood and employed. The same applies to the process of heuristic inquiry.

This reading is contrasted with the one of editors of the *Metaphysics* Bonitz, Jaeger, Ross and Frede & Patzig. Since Bonitz fails to grasp the formal (*logikē*) characteristic of ‘essence (*tēe*)’ as the definable entity, he suggests to transfer the text on the learning process (1029b3-12) by raising a puzzlement about the intelligibility by nature of ‘essence (*tēe*)’. He was puzzled by Bekker’s text and says that ‘Why is it a way we go across, by learning it [*tēe*], from what is more knowable to us to what is more knowable by nature? Concerning the essence: it [*tēe*] is in the least degree (*minime*) that its nature is indeed first and nearest [for us], but it is the most remote and hidden for us’<sup>21</sup>. When Bonitz transposed the passage from VII4 to VII3, He took it for granted that the essence is nothing but [N2] the entirely knowable by nature.

The degrees of two knowable things by nature should be instantiated according to Aristotle’s intention by two ways of describing substance as [N1=[a]t1] the essence and as [N2=[b]t2] the form. In the last sentence of chapter 3, he ‘firstly’ sets the object of inquiry i.e. the form in the sensible substances. The corresponding *second* discussion begins in VII 17, where Aristotle is engaged in an *ergon* approach to the form by ‘taking once more another starting point’ (1041a7). This is a heuristic inquiry into substance through the soul’s faculties, such as perception and *nūs* (comprehension) the target of which is ‘the substance which is the one having been separated from sensible substances’ and ‘the non-composite substances’ (VII17. 1041a8, IX10. 1051b27). Within the framework of the *first* step considering perceivable substances, he ‘firstly’ theorizes about the essence in a *logikē* fashion in VII4 (1029a34, b13). When the *logikē* discussion of essence is followed by his discussion of natural and artistic generation in VII7, Aristotle identifies the form according to the account the essence; ‘I say form to be the what it was to

20 In this passage, he reminds us of the process of intellectual learning in *Posterior Analytics* II, where he says ‘[b] all intellectual teaching and learning come about from [a] already existing knowledge’ (71a1). [b] The goals of learning and the inquiry are the same, although the teacher knows it in advance in the case of learning. It is required for a learner to have [a] a preexisting knowledge of the meaning of a term; ‘one must understand what the thing said is (*ti to legomenon esti xunienai dei*)’ such as what the word ‘the triangle’ signifies (71a13). [a] The meaning of a term ‘F’ is required of ‘being already aware of (*progignōskein*)’ for the further inquiry into [b] how F is and what F is.

Charles argues that the first stage of inquiry (grasping what a name signifies) is ‘semantically shallow’, without involving the knowledge of either the essence or the existence of the kind in question ([Meaning] p.1f). As he says ‘Semantics is one thing, epistemology is another’ (p.162), the act of referring is a linguistic one. The success of reference is, however, ultimately guaranteed by observation or discovery, just in such a case as the referent is in sight of the interlocutors. Semantically shallow understanding does not contradict the dual function of signification according to which one linguistic act contains both the relation between the linguistic expressions and the reference through grasping the meaning at one time. For the dual signification is set by Aristotle as the case satisfying simultaneously an epistemological condition too by putting ‘a man being set before a speaker’ (*Top.19.103b29: ekkeimenon*). We can talk about a star billions of light years away, by referring to it through grasping its meaning.

21 Bonitz, [Metaphysica] p.303. He suggests that 1029b3-12 (*pro ergū.dia ton autōn*) should be placed after 1029a34 (*en tautais zētēteon prōton*). He claims that since the pronoun ‘*autū* (it)’ in b12 ‘undoubtedly’ signifies ‘*tēe*’ in b2, ‘*tēe*’ which is ‘mentioned long before’ would be ‘forgotten (*oblivion*)’ (p.303). But, Bonitz’ claim will be undermined, if one can agree that he has form and essence in mind as the examples of [a] [b] throughout in these ten lines. Besides, people like Bonitz, Bostock conflated this process of learning with the induction proceeding from the perceptible particular to the universal. Bostock, [Z and H]. p.83. See Ross, [MetaphysicsII] p.166.

be of each thing and the primary substance' and characterizes this essence to be identified with form as 'substance without matter', which leads an inquiry into immovable thing in terms of form (1032b1, 13, cf. 1032a24, b14, 1052a4, 1071b4, b21).

The identification between essence and form is grounded by Aristotle's *logikē* analysis of essence in VII4-6; 'the essence of each thing (F) is what is said in virtue of (F) itself' (VII4.1029b14). The locution of 'in virtue of itself' expresses an internal or *per se* relation between the essence of F and the thing F. He asks whether 'to be you' (substance term) and 'to be musical' (accident term) are the same or not and further asks 'whether Socrates and to be Socrates are the same' (1029b14, 1032a8). The *logikē* discussion on the unity of a thing will be applied to the form in such a way that the form of you is what is said in virtue of yourself. This sounds very trivial. But this kind of *per se* locution conveys an information to direct further inquiry; an inherent form inside of a sensible substance say Socrates must be said in virtue of himself and that the focal structure of substance is endorsed by this formal discussion. This implies that the form of Socrates which is his soul is, while being alive, inseparable with himself so that Socrates as a whole is unitary, independent substance signified by 'this' (cf.1032a8, 1043b2-4).

The *logikē* approach in *Metaphysics* VII4 has many parallel discussions in the *Topics*. I shall simply point to seven similar arguments and claims, indicating parallel passages in the *Topics* and VII4: (1) 'How one ought to ask (*pōs dei erōtan;*)' (e.g. 155b1, 175a1, 183a30, b10: '*pōs dei legein;*'1030a27); (2) 'How many ways each thing is said' (e.g. 105a23, 106b14, 108a20: 1030a17-19); (3) 'What a thing is' is said in plural ways' (139b25: 1030a18); (4) 'what a thing is' is primarily ascribed to substance (103b27-29, 35-38: 1030a17, 29); (5) 'the genera of predications' (e.g. 103b20, 107a3, 178a5: cf. 1034b14, 1051a35), (6) the dual function of signification (103b20, 30, 107a3: 1030a18-21); and lastly (7) the focal (*pros hen*) structure (106b29-107a2: 1030a32-b3). These parallel passages indicate that Aristotle has already developed the core part of the method in the *logikē* manner (*logikōs*) and given this method its name '*logikē*' in *Topics* I14. Analyses of 'how many ways each thing is said' and 'how one ought to raise question' in the *Topics* give rise to the *logikē* art concerning on argument. In fact, he has fully employed these devices in his inquiry into substance in VII4-6.

## XI. Conclusion

I have argued that (a) the method of Aristotelian dialectic consists of theories of (a1) (a2) terms and predications and (a3) *topos* and (a4) syllogism. This method is at work not only in this undertaking edited as the *Topics* but also in his theories of demonstration and being in other undertakings. Only when the theories of demonstration and being are added, can Aristotle complete his project, to show how an Academician can act as both a philosopher with knowledge and as a dialectician who dialectically examines any thesis proposed. This is because he began his initial project with aim of strengthening weak Socratic dialectic by establishing a formal system to grasp what a thing is.

When Aristotle composed and edited the *Topics*, he reflected on the history of his project, mentioning at various occasions the products of other undertakings as well. Through these theoretical studies, such as the theories of division and demonstration, he can describe one goal of initial project as (c) submitting and defending a thesis more specifically 'as the person having knowledge' (100a20, 183b3). No one can deny that one can defend one's thesis better, if one has knowledge.

Aristotle's development of his favored method is carried out not dialectically in the realm of opinion,

but philosophically through the *logikē* method. This formal and universal dimension is ultimately founded in the most certain principle of non-contradiction. It constitutes the art of argument which offers the basis for logic as well as ontology. Since Aristotle devised ‘dialectic’ at an earlier stage in his career, the theoretical part of dialectic, as the *logikē* art of argumentation, can be employed in all his other theoretical works, even if the peirastic practice of dialectic remains a peculiarity of the *Topics*.

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