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The Liar Paradox as a reductio ad absurdum argument

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Title: The Liar Paradox as a Reductio ad Absurdum

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1. Introduction

The paper discusses two seemingly separated topics: the origin and function of the Liar Paradox in ancient Greek philosophy and the *Reduction ad absurdum* mode of argumentation. Its goal is to show how the two topics fit together and why they are closely connected.

The accepted tradition is that Eubulides of Miletos was the first to formulate the Liar Paradox correctly and that the paradox was part of the philosophical discussion of the Megarian School. Which version of the paradox was formulated by Eubulides is unknown, but according to some hints given by Aristotle and an incorrect version given by Cicero¹, the version was probably as follows:

The paradox is created from the Liar sentence 'I am lying'. Given this sentence, the paradox is generated in two stages. First, assume that the speaker is telling the truth when he is saying 'I am lying', and thus, the case is that he is lying. Therefore, if he speaks the truth then he is lying. The second half of the paradox is based on the assumption that the speaker is lying when he says 'I am lying'. In this case, what is asserted is not the case and, thus, he is not lying. Therefore, if he is lying then he is telling the truth (assuming that 'not false' is equivalent to 'true'). The conjunctual conclusion from the two halves is that he is telling the truth if and only if he is lying. This is a self-contradiction or a logical absurdity.

Robert Martin, the editor of *Recent Essays on Truth and the Liar Paradox*, writes in his introduction that "the Liar Paradox has intrigued and frustrated philosophers since the fourth century BC"². Charles Parsons goes on and asks, "Why is it that today... the Liar Paradox is still discussed as if it were an open question?"³. Many solutions have been offered to solve the paradox but none have received any agreement. The two anthologies edited by Robert Martin represent the enormous diversity, as well as the disagreement, which characterize the field⁴. This paper does not offer yet another solution, but proposes instead a way to understand its philosophical nature and function. A better understanding of any paradox is after all a sort of a solution. The purpose of this paper is to tell a story about the philosophical background of the emergence of the Liar Paradox and its philosophical role in one of the important controversies in ancient Greek philosophy⁵. It is more of a story than a scholarly commentary because all the surviving Greek texts that mention the paradox are sparse and seem enigmatic on first view. It is difficult to understand each text separately, and even more difficult to see all of them as part of one philosophical discussion. No one knows what was the exact version formulated by Eubulides, nor is it known just what motivations Eubulides may have had for presenting the paradox. The history of the paradox through the stages of Greek philosophy is also unknown. These are presumably the reasons why the main scholarly commentaries of Greek and Hellenistic philosophy do not give a thoroughly analysis of the Liar Paradox, of its origin, motives and function.

The proposed story of the Liar Paradox in Greek philosophy has two advantages here. Each ancient text that mentions the Liar Paradox becomes meaningful in itself and many texts appear to take part in an important philosophical controversy. The controversy involves the justification of realism and its concepts of objective truth and certainty, which was central to Greek and Hellenistic philosophy. The main claim that underlies the proposed story is that the Liar Paradox was employed by Eubulides and later Greek philosophers to criticize the realist position in metaphysics and epistemology. First it was employed by the Megarian School against the realism advocated by Aristotle, but it was most notably employed by the skeptics of the Academy against the realism held by the Stoics and their claims to knowledge. It was also part of the intensive use of the *Reduction ad Absurdum* mode of argumentation by Greek skeptics. The story in principle is that the Liar Paradox was used as part of a *Reduction ad Absurdum* argument that was intended to refute the realist

concept of truth, as first formulated by Aristotle and then developed by Stoicism. The Liar Paradox was used as a justification of the claim that the realist concept of truth is logically inconsistent and thus has to be rejected.

The proposed understanding of the Liar Paradox is, however, contrary to the prevalent modern understanding of the paradox, according to which it is essentially a semantic anomaly of natural language and thus in need of a solution or dissolution. The remedy proposed is usually the formalization of a better theory of meaning, which will avoid the paradox all together and free language from this threat. The proposed story alters this semantic tendency, offering a new way to understand the Liar Paradox even in its modern context. In this story, the paradox is not a part of natural language or any formal language, but an undesirable consequence of the metaphysical and epistemological doctrine of realism. Thus, the paradox should not be classified and understood as a semantic paradox. It should be reconstructed anew as part of a metaphysical argument resembling other well-known skeptical arguments. It stops being an anomaly in need of a solution and becomes a part of a refutation used by Greek and modern skeptics to criticize various dogmatic doctrines in philosophy. Although the paper will not touch upon the modern discussion of the paradox, the implications are obvious

1.1 The Story of the Liar Paradox

The proposed story of the Liar Paradox in Greek philosophy is interwoven with the story of a major controversy between two main trends in Greek philosophy: skepticism and realism. Among the schools that influenced the development of Greek skepticism is the Megarian School, which among its many philosophical achievements, also first formulated the Liar Paradox in its correct form. The school adopted Parmenides' metaphysics, was influenced by Zeno's dialectics, and rejected the realism advocated by Aristotle. The philosophizing method used by this school was refutations by means of *Reductio ad Absurdum* or *Reductio ad Impossibile* modes of argumentation. This method was called *dialectics* in Greek philosophy. One of the arguments developed by the Megarian School in their controversy with Aristotle's philosophy was based on the Liar Paradox. The premises of this argument were necessary assumptions of the realist concept of truth, as defined by Aristotle, and its conclusion was the contradiction generated by the paradox. The derivation of a contradictory conclusion was used as a basis for refuting its premises, in accordance with the standard use of the *Reduction ad Absurdum* argument form.

In this way, the Megarian School showed that the realist concept of truth held by Aristotle is necessarily inconsistent, and thus must be rejected on logical grounds. However, the Megarian School did not engage only in negative philosophizing, but also adopted Parmenides' metaphysics as part of its positive philosophy. The rejection of Aristotle's philosophy was part of their project to establish this metaphysics, similar to the way Zeno of Elea had defended the positions held by his teacher, Parmenides. The details of their philosophy are unfortunately not very well known at present. The above sketch does provide, however, the background for the emergence of the Liar Paradox⁶.

The subsequent events in the history of the Liar Paradox mainly involve its place in the controversy over the justification of realism. Some of the philosophers who were influenced by the Megarian philosophy were members of the skeptical Academy. The skeptic philosophers of the Academy continued to use the Megarian

dialectical method, but now they used it against any philosophical claim that purported to be certain, while abandoning the Parmenidean metaphysics that had been adopted by their Megarian forebears. They focused on strengthening and improving the Megarian negative arguments and the dialectical method of arguing that used mainly to provide refutations. The *Reductio ad Absurdum* mode of argumentation was only one. These philosophers also adopted the Liar Paradox as an anti-realist argument. The version of realism that the skeptics rejected was not the Aristotelian one but the Stoic version⁷. Yet, some of the philosophers of the skeptical Academy were not satisfied only with negative philosophizing, but developed a relativist and anti-realist epistemology and an alternative perspective to the ruling realist metaphysics. The most famous head of the skeptical Academy, Carneades of Cyrene, is known for his theory of plausibility (*pithamós*), which was introduced as an alternative epistemology to the Stoic realism and then became a wholly new philosophical

perspective. The skeptics generally, proposed various subjective and anti-realist concepts of truth and justification instead of the realist concepts that were advocated mainly by the Stoics. The place of Liar Paradox in this continual controversy was that of refuting the logical consistency of the realist concepts of truth and certainty, thereby giving some plausibility to alternative anti-realist concepts⁸.

The main claim of the paper is that this account fits well with the known evidence regarding the Liar Paradox in Greek philosophy. The evidence consists of texts that refer directly to the Liar Paradox and those that refer to the various schools that dealt with the paradox, either accepting or rejecting it. These are mainly the Megarian School and the skeptical Academy, on the one hand, and the opposing realist camp, mainly Aristotle and the Stoics, on the other. This story will be elaborated in the rest of the paper.

1.2 Evidence about the Liar Paradox in Greek Philosophy

The main scholarly problem faced by every attempt to understand the place of the Liar Paradox in Greek philosophy is the scarcity of the evidence on this topic. All that is available today are a few fragments and testimonies, most of them nothing more than titles of books which supposedly dealt with the paradox. The ancient doxographers, such as Diogenes Laertius, Plutarch and Sextus Empiricus, only mention the paradox, without providing any information about the philosophical context in which it was formulated and discussed. All the substantial testimonies that explicitly mention the paradox will be discussed here⁹.

The earliest evidence is from the first century AD, but it probably refers to the fifth century BC. The Liar Paradox was known from ancient times as the paradox of Epimenides. St. Paul brings the story of Epimenides of Crete in his Epistle to Titus. This was just before Titus left for Crete to take care of the spiritual needs of the believers and to spread the Christian message among the pagans. It seems that the second mission was expected to face grave difficulties due to some moral flaws of the Cretans. In this context, Paul says:

[*One of the Cretans, their own prophet, said of them*]: The Cretans are always Liars, evil beasts, lazy stomachs. [3B1]¹⁰

This remark is presented as a direct citation of Epimenides. If so, then the beginning of the Liar Paradox is somewhere at the end of the sixth century and the beginning of the fifth century BC.

In light of the context of this citation, it is reasonable to assume that Paul was not intending to discuss abstract philosophical issues in logic and metaphysics with Titus. He said what he did in a specific religious and moral context, with the intention of pointing out the dubious reputation of the people of Crete from ancient times¹¹. What Epimenides said is not a genuine paradox. One can consistently assume that he lied, or at least did not tell the truth¹². Even the Greeks noticed that there is something wrong with the story in which one of the Cretans says about his compatriots, including himself, that they are always liars. Nobody took this story in this formulation seriously because of the trivial solution: One can assume that one of the Cretans told the truth at least once, even if accidentally and due to absentmindedness. In this case, Epimenides' assertion is simply false and it is not true that all the Cretans always lie. Thus a religious man, who was also a prophet, was lying - as if this fact should surprise us. It surely did not surprise the Greeks, considering their particular religion¹³.

There is no information about this paradox until the middle of the fourth century BC. An interesting fact is that Plato probably did not know about it. This can be inferred indirectly from the *Euthydemus*, which is not later than 420 BC. In this dialogue, Plato discusses problems that are close to that of the Liar Paradox, but he does not mention the paradox itself, does he make use of its particular characteristics. This is evident from *Euthydemus*' discussion of the question of whether false statements have a meaning. According to *Euthydemus*' theory of meaning, all statements must be true and none can be false. The justification for this is that a meaningful statement is one that describes actual state of affairs. Accordingly, a false statement must describe what is not the actual case, and thus, what does not exist. This, however, is just nothing at all, and no statement can say "nothing":

...he who tells what is, and things that are, tells the truth...No one, I suppose, speaks what is not - for thereby he would be making something; and you have agreed that one cannot so much as make what is not - so that, by your account, no one speaks what is false¹⁴.

The corollary is that no contradiction is possible either, since the logical subject of two contradictory statements must be the same, yet one of them must describe what is not the case. Two contradictory statements, therefore, must describe two different subjects; otherwise, one of them is meaningless¹⁵. This sort of discussion is clearly relevant to the difficulty raised by the Liar Paradox, since it is a typical case of two contradictory statements with one logical subject (i.e., 'what I have said'). It, however, misses the point raised by the paradox, since the paradox describes, *prima facie*, perfectly legitimate circumstances of true and false statements and a contradiction which arises from a specific legitimate use of 'true' and 'false'. Plato, in this section of the dialogue, does not address the conflict between a given statement, regardless of its truth-value, and an assertion of the truth or falsity of the statement. In modern terms, he does not recognize the difference in type between a statement in an object language and describing it or assigning it a truth-value in a meta-language.

Aristotle's *On Sophistical Refutations* is the source for the second direct evidence of the Liar Paradox.

The argument is similar which deals with the question whether the same man can say what is at the same time both true and false¹⁶.

The passage is taken from one of Aristotle's early works, and thus dates to the middle of the fourth century. The fact that the paradox appears precisely in *On Sophistical Refutations* has much significance, since Aristotle deals there with syllogisms identified with philosophical controversies and the polemics of everyday life. Most of the *Organon* is dedicated to arguments used in mathematical subject matter. Thus, it can be inferred that Aristotle saw the Liar Paradox as part of a philosophical controversy rather than a logical or semantical issue. This is an indication of the place the paradox had in the discussions held in the middle of the fourth century.

The paradox's reputation and popularity in the beginning of the third century BC can be inferred from its being mentioned in a literary text. One of the apocryphal stories connected with the Liar Paradox is the story of the death of the poet Philetas of Cos. The Roman writer Athenians of Naucratis tells that Philetas died because he was troubled by the Liar Paradox:

Like Philetas of Cos, therefore, who pondered what he called 'the liar argument' (*pseudológov*), you run the risk some day of being quite dried up, as he was, by these worries. For he became very much emaciated in body through these studies, and died, as the epitaph on his monument shows: 'Stranger, I am Philetas. The liar argument (*lógon o pseudómenós*) caused my death, and studies of riddles late at eve¹⁷.

There is probably more than one liar here in the case of Athenians. However, his testimony, doubtful as it is, does indicate one important fact. The Liar Paradox was known at the beginning of the third century even outside philosophical circles. Assuming that the Greeks' intellectual life was similar to that of modern times, this testimony has an important implication: The fact that a philosophical problem became known in literary circles shows that it must have been widely discussed previously in philosophical circles.

The fourth evidence is the testimony that Eubulides of Miletos was the first to correctly formulate the Liar Paradox, as well as several other well-known paradoxes. Eubulides lived in the fourth century and was a pupil of the first head of the Megarian School, Euclides of Megara¹⁸. This testimony accords with those of Aristotle and Athenians. Accordingly, the paradox existed and was being already discussed in the middle of the fourth century. The fact that it was formulated and discussed by Eubulides and the Megarian School has important consequences for understanding it. Neither the version of the paradox as was formulated by Eubulides, nor the philosophical context in which it was discussed, are known, however.

Philosophical interest in the paradox continued among the philosophers of the Peripatetic School. This fact is significant, since the Megarian School, which originated the paradox, is known to have been a stern philosophical opponent of Aristotelian philosophy. Theophrastus of Arsos, a pupil and a friend of Aristotle, and

philosophical epistemological methodology. The paradoxes of Liar, a paradox of the Liar, and the head of the school after Aristotle's death in 322, wrote three books on the Liar Paradox.

On Truth and Falsehood, one book...

Two books of Refutative Arguments.

Theses, three books¹⁹.

However, nothing is known about the content of these books, apart from their titles.

Philosophical discussion in the Liar Paradox continued well into the third century, as it is evident from the extensive work done on the subject by Chrysippus of Soli. He wrote several books on the paradox²⁰.

Introduction to the Liar argument (*pseudómenon*), addressed to Aristocreon, one book.

Arguments of the Liar Type, to serve as Introduction, one book.

Of the Liar Argument, addressed to Aristocreon, six books.

...

Reply to those who hold that Propositions may be at once False and True, one book.

To those who solve the Liar [argument] by dissecting it, addressed to Aristocreon, two books.

...

On the Solution of the Liar, addressed to Aristocreon, three books.

...

To those who maintain that the Premises (*lémmata*) of the Liar are false, one book.

These books discuss the nature of the Liar Paradox and the various solutions that had been offered for its solution, including probably the one proposed by Chrysippus himself. At least three of the books introduce the problem raised by the paradox. The other books survey the various approaches to its analysis and its possible solutions. For instance, one of them deals with the possibility that propositions (*axiōma*) can be simultaneously true and false. Another one deals with the possibility of logically decomposing the paradoxical argument and showing why it is not a paradox after all.

Chrysippus was influenced to a great extent by the Megarian teachings on logic and dialectics. He eventually became a head of the Stoic School in the third century. Thus, it is evident that the paradox was discussed to a great length by the Megarian School in the third century. Chrysippus also proposes a solution to the paradox, one of the two that survived from this period, the first one having been proposed by Aristotle. The two solutions will be discussed below (section 5), since they provide important support for the interpretation proposed here. For now, these two solutions make the best sense if they are interpreted as a classical move facing a *Reductio ad Absurdum* argument, such as the one that uses the Liar Paradox. The titles of the books written by Chrysippus are indeed similar to the titles used today for books that deal with the Liar Paradox. Not much has been changed from the third century BC as far as the titles of the books are concerned. Again, the problem is that almost nothing is known about their content.

The earliest full version of Liar Paradox is given by Cicero thus belonging to the Roman period from the first half of the first century BC. In his *Academica*, Cicero introduces the paradox as follows:

What of the fact that this same science [dialectic] destroys at the end the steps that came before, like Penelope unweaving her web?... Clearly it is a fundamental principle of dialectic that every statement (termed by them [stoicism] *axiōma*, that is, a 'proposition') is either true or false; what then? Is this a true proposition or a false one - 'if you say that you are lying and say it truly, you lie'? Your school [Stoicism] of course says that these problems are 'insoluble.' which is more vexatious than the things termed by us [the skeptical

This passage will be discussed in section 2, below. The discussion of the Liar Paradox by Cicero in his *Academica* is the most valuable source of information about the nature of the Liar Paradox and its philosophical role in Greek philosophy. Although Cicero is the source to the earliest full formulation of the Liar Paradox, his version is logically ill formed and inaccurate.

There are other known versions of the Liar Paradox, but all of them are later versions that belong to Roman and Christian sources, most of them are dating to the second and third century AD²². Not much can be learned from these versions about their Greek or Hellenistic origin or about the philosophical context in which they were discussed. This concludes all the evidence about the Liar Paradox. It is clearly insufficient for a thorough understanding of it. Any philosophical and scholarly interpretation of the Liar Paradox in Greek philosophy must therefore be a speculative. Nevertheless, this paper ventures at offering such a speculative interpretation - a story of a paradox.

1.3 The controversy between realism and skepticism in Greek philosophy

Before narrating the details of the story, two main assumptions that guide the proposed interpretation will be introduced. The two assumptions are supported by the evidence brought above and in the following.

(A) First assumption: the Liar Paradox is not a sophism but a philosophical issue.

The first assumption is that the Liar Paradox is not a mere vacant sophism or brain twister, but part of a fundamental philosophical issue having important implications for basic doctrines in philosophy. In light of this assumption, the goal of the proposed interpretation is to find the role of the paradox in the general philosophical discourse in Greek philosophy. This assumption is based, *inter alia*, on the titles of Chrysippus' books. These titles show that the paradox was considered an important and complex philosophical problem. The various approaches to analyzing the paradox hinted at by some of titles also reveal that the paradox was considered a problem with a bearing on basic philosophical difficulties.

However, the most interesting title for our present propose is the one that deals with the possibility that the assumptions, leading to the paradox are just false. The Greek word *lêmma*, which appears in the title of the book, was used by Chrysippus in other contexts as a well-defined logical concept to designate the premises or assumptions of an argument (*lógos*). These are the propositions (*axiōma*) that one agrees upon in advance for the sake of establishing (*epiphorá*) the conclusion²³. According to Chrysippus, a valid argument is one such that the negation of its conclusion is inconsistent with the conjunction of its premises. He applies this definition as a corollary to the case in which an argument has a false or even a contradictory conclusion. He discusses the possibility that the falsehood of the premises can be inferred from this, given that the argument is valid. The inference regarding the truth-value of the premises is based on this assumption. Only in a valid argument can the falseness of the premises be inferred from the falseness of the conclusion. Chrysippus' discussion is an important justification of the suggestion that the Liar Paradox was part of a philosophical argument or a chain of such arguments meant to refute the premises responsible for its emergence²⁴. Consequently, this book of Chrysippus probably dealt with the possibility that, although the Liar Paradox is a valid argument, it is not a sound one, and thus, resembles the argument form of *Reductio ad Absurdum*. One of the meta-logic achievements of Stoicism involved the nature of arguments, and the one that is important to the discussion here is the clear definition of the difference between valid and sound arguments. There is evidence that paradoxes were used in the Megarian School and the skeptical Academy as conclusions of having *Reductio ad Absurdum* arguments. Still, the premises of the argument in which the Liar Paradox was used as a conclusion are unknown. It can be argued, however, that the paradox must have been a part of a skeptical argument that questioned the legitimacy of some important philosophical claims.

(B) Second Assumption: The premises that led to the emergence of the Liar Paradox are necessary to realism.

The second assumption that the proposed interpretation relies on involves the question just asked: What were the philosophical claims that functioned as premises to the argument with the Liar Paradox as its conclusion? In answering the question, the proposed interpretation embraces a wide conception of the main trends in Greek and Hellenistic philosophy and the main issues that troubled the philosophers of these periods. Central to it is a specific understanding of Greek philosophy, according to which skepticism stands at the focus. Moreover, one of the main goals of Greek skepticism was the metaphysical and epistemological criticism of the realist concept of truth. This understanding of Greek skepticism is contrary to the traditional interpretation, which considers only clearly nihilistic views to be skeptical ones. Only recently has there been a critical modification of the understanding of the centrality and significance of Greek skepticism. One of the claims is that most of the criticism raised by Greek skepticism was aimed at the realist concept of truth, such as the Aristotelian or the Stoic one. The skeptical Academy, as one of the important trends in late Greek skepticism, even formulated an epistemological alternative to the realist concept of truth. Contrary to the realist, absolutist and objective concept of truth, it formulated a relativist, subjective and anti-realist one. The criticism raised by Greek skepticism against realism was extended even to logic. The arguments of the skeptics made use of logic for analyzing metaphysical and epistemological claims, but this use was serious and conscious²⁵.

The proposed interpretation relies on the work done by Leo Groarke on the sources and nature of Greek skepticism²⁶. The main thesis Groarke advances is that Greek skepticism is the ancestor of modern anti-realism, since Greek skepticism is mainly a criticism of realist metaphysics, epistemology and theory of truth. Groarke argues at length that the key to understanding Greek skepticism, as with modern anti-realism, is its criticism of the realist concept of truth. Greek skepticism even discusses the possibility of an alternative concept of truth as a basis for anti-realist epistemology and metaphysics; a concept based on subjective and relativist characteristics. In most of the trends in Greek skepticism, the concept of truth is based on several characteristics, for instance, that belief is conditioned by the attributes of human nature (e.g., perception), the cultural context, the philosophical presuppositions a person takes upon himself and the like²⁷. Groarke's work is used here as a scholarly framework for the proposed interpretation. It remains now to see how the Liar Paradox can be integrated into this controversy as a *Reductio ad Absurdum* argument design to refute the realist concept of truth.

2. The Liar Paradox as a form of skepticism in Greek and Hellenistic philosophy: Cicero's testimony in his *Academia II*.

The pivotal evidence for the proposed interpretation is the historical fact that the Liar Paradox is explicitly formulated as one of the arguments used by the skeptical Academy²⁸. The crucial testimony is given by Cicero in his *Academica*, in which the Liar Paradox is introduced as one of the types of critical arguments used by skepticism²⁹. Cicero's work deals with epistemological issues connected to the theory of knowledge and introduces the various contrasting schools on this issue. It joins three main figures in the history of the Academy in the Hellenistic period: The first is Carneades of Cyrene, who represents the moderate skepticism of the middle Academy. He was one of the most famous heads of the skeptical Academy and the successor of Arcesilaus of Pitane. He is known for his theory about plausibility (*pithamós*) as the essential concept in his criticism of other positions, which can also be understood as a basis for a skeptical and anti-realist criterion of truth. The second figure is Philo of Larissa, the last head of the skeptical Academy, the successor of Clitomachus in 109 BC. He tried to formulate a compromise between the skepticism of Arcesilaus and Carneades and the original Platonic dogmatism. He also was engaged in epistemological disputes with Antiochus of Ashkelon, the third figure. Antiochus was a pupil of Philo of Larissa and a member of the later Academy. He rejected the Academy's skepticism, which had ruled since Arcesilaus of Pitane. He proposed a dogmatic and syncretic system of philosophy, a mixture of Platonic, Stoic and Aristotelian ideas, which he presented as the 'original tradition' of the pre-skeptical Academy. He founded his own school, regarded by some as a continuation of the Academy, which was accordingly named the "fifth" Academy of the first century BC³⁰.

Cicero's work consists mainly of two speeches: The first was given by the Roman commander Lucullus in favor of Antiochus of Ashkelon and against Carneades of Cyrene. After a short intermediate chapter, the Cicero's reply in favor of Carneades' skepticism is introduced.

2.1 Lucullus' speech: A defense of the dogmatism of Antiochus of Ashkelon

Lucullus begins by arguing that the philosophers of the Academy, such as Arcesilaus and Carneades, were distorting the theories of the ancient philosophers in attributing them the opinion that it is impossible to know anything (*Academica* II.17-18). Lucullus argues that the great philosophers of ancient times did succeed in establishing the truth and even organizing the body of philosophical knowledge (II.14). He tries to show that those who argue, like Philo of Larissa, that it is impossible to know anything are caught up in a contradiction. For if nothing can be known, then this claim too cannot be known; thus it is impossible to know that everything is incomprehensible (II.17-18). Using the Stoic viewpoint, Lucullus defends the adequacy of sensory perceptions as a criterion of truth, given that they operate normally (II.19ff). Furthermore, Lucullus argues that the claim of the philosophers of the Academy that knowledge is impossible takes all value out of life and eventually destroys life itself (II.31). Their theory of plausibility makes it impossible to determine clearly what is good and bad, true and false (II.33). The rejection of the possibility of knowledge eliminates any possibility of action or free will in life (II.38-39). In his speech, Lucullus addresses some of the main claims made by the skeptics of the Academy. One of them is that, although some sense perceptions are true and some are false, there is no way to distinguish between them (II.40). For instance, there is no way to distinguish between imaginary perceptions, such as those caused by dreams, drunkenness or insanity, and true perceptions. Lucullus' answer to this basic skeptical claim is that common sense can distinguish clearly between them and can thus serve as a reliable criterion of truth (II.41-55). On the one hand, Carneades argues that the same properties are common to truth and falsehood, yet on the other he accepts the positive theory of plausibility. The acceptance of the theory of plausibility is, however, in contradiction to the negative skeptic claims. Arcesilaus is more consistent, says Lucullus, since he is more reserved in his judgment and confines himself solely to the negative criticism of knowledge (II.56-60). Lucullus concludes his speech in advising Cicero not to follow the school that mixes the true with the false, thus eliminating any possibility of judgment or ability to initiate rational actions. Cicero, who had discovered the conspiracy of Catilina, exposed the most secret plots and declared under oath and with confidence that he knew all about them, cannot deny that there are things that can be known (II.61-62).

After a short intermediate chapter comes the Cicero's reply. He begins by responding to the "advice" given to him by Lucullus, according to which he is to avoid associating himself with an inappropriate school. Cicero says that he did not join the school of Arcesilaus and Carneades because of misjudgment or weakness of mind. On the contrary, he is eager to find the truth and thinks that the most beautiful thing is to discern truth and the ugliest thing is to mistake falsehood for truth. The duty of the wise man is to avoid hallucinations and make sure that he does not err in his judgment (II.64-68). However, Cicero criticizes Antiochus for abandoning the skeptical theory of the middle Academy and joining Stoicism (II.69-71). Then he attempts to answer the Lucullus' criticism: The philosophers of the Academy did not distort the views of the Presocratic philosophers, since they did doubt the possibility of knowing the truth (II.72-78). Furthermore, the justification offered by Lucullus for his assertion that the senses, when functioning normally, yield reliable criteria of truth is very unsatisfactory and superficial (II.79-81). Cicero's reply is composed of four main claims: (a) Some sense perceptions are false. (b) False perceptions are indistinguishable from the true ones. (c) There is no way to determine which perceptions are distinguishable and which cannot. (d) Any true perception can merge with another perception, which is indistinguishable from it, and yet cannot be recognized as such (II.81-86). The claim that people who were asleep, drunk or insane know that their perceptions were false after they resume their normal state and clear vision does not prove anything. These hallucinations were judged as true and thus real at the time they occurred (II.88-90).

These arguments are part of the tendency of the skeptical Academy to doubt and consequently reject the possibility of knowing the truth in its realist sense and establishing it beyond any reasonable doubt. Cicero divides their arguments into three main groups. First, are arguments that criticize the possibility of infallible

knowledge based on empiricist notions. These arguments concentrate mainly on the limitations of the senses. In the second group, Cicero gathers arguments taken from early skeptics, such as Democritus, Xenophon and Protagoras, which were further developed by the skeptical Academy for their own use. These two groups constitute the arguments that are directed against the reliability of the senses. The third group of arguments will be discussed in the next section.

2.2 The place of the Liar Paradox in the philosophy of the Skeptical Academy: Criticism of dialectics

The second part of Cicero's speech contains the third group of arguments, which involve the paradoxes and were the basis for the criticism of the reliability of the mind and rational thought. Not only sense perceptions are unreliable, but also the mind is incapable of perceiving the truth. These paradoxes were taken mainly from the Megarian school and the Socratic heritage. One of the main influences of the skeptical Academy was the use of dialectics. However, the skeptics of the Academy showed that dialectics, which was supposed to distinguish truth from falsehood according to Stoicism, is often incapable of determining what is true and what is false. At this point Cicero examines the nature of dialectics, which was adopted by the skeptical Academy as its philosophical methodology of inquiry³¹. The Liar Paradox and other paradoxes are discussed in this context. Cicero first discusses the *Sorites* paradox and shows that dialectics is unable to resolve the problem of the addition or subtraction of very small particles. The same reasoning that is used for the *Sorites* paradox occurs in many cases where a clear distinction is sought, as between rich and poor, or big and small. There is no reliable way of determining how much must be added or subtracted for the construction of a precise concept. Then Cicero discusses the Liar Paradox, which he introduced as part of the skeptical criticism of the possibility of knowing the truth by the use of dialectics. Dialectics cannot determine if the following sentence is true or false: "If you say that you are lying and say it truly, you lie?" (II.91-98, see the citation above). This formulation of Cicero is logically incorrect. One correct formulation is given at the beginning of the paper.

The Liar Paradox is discussed by Cicero as one of the refutation arguments used by the skeptical Academy and he analyzes it as such. He starts by listing the assumptions that lead to the paradox:

- (1) Propositions are identified as the truth-bearers.
- (2) The principles of classic logic (the principles of contradiction, excluded middle and bivalence) determine truth.
- (3) The correspondent relation: A sentence is true (e.g., "it is light" is true) if and only if reality is as described (e.g., it is now daylight).

These three assumptions constitute necessary conditions for any realist theory of truth, such as these advocated by Aristotle or the Stoics. It is clear that they are a summary of the necessary conditions that any realist concept of truth must presuppose. Exactly these conditions were introduced by Aristotle as part of his detailed discussions in the *Organon* (see section 3, below). Cicero claims that these are the assumptions that lead to the Liar Paradox. This main argument is that there is no crucial difference between the Liar sentence 'I am lying' and any other simple descriptive sentence, such as 'It is light'. First, both are equally legitimate truth-bearers. Second, both of them are subject in the same way to the same laws of logic. Third, the Liar sentence is a legitimate substitution in the realist truth schema of correspondence, just like the sentence 'It is light'. This is true even if substituting the innocent sentence does not raise any problem, while substituting the *Liar* sentence exposes the paradoxical nature of the realist truth definition. The Liar Paradox is thus presented as part of a skeptical argument of the *Reductio ad Absurdum* form. It aims at refuting the foundations of a realist theory of truth, the Stoic theory in this case.

The exposition given by Cicero in his *Academica* hints at the philosophical context in which the Liar Paradox was discussed. According to his testimony, the skeptical arguments of the third group the *Reductio ad Absurdum* form. The Liar Paradox was used by the skeptical Academy as one of the paradoxes using this

form of argument, thus constituting part of an argument that was designed to show that several crucial assumptions led to absurdities. The assumptions above are basic and necessary to realism in the form held by the Stoic school at that time. According to Cicero, the paradox threatens the very nature of the realist

concept of truth as a correspondent concept that is based, *inter alia*, on the principles of contradiction and the excluded middle. These principles constituted the semantical and metaphysical content of the realist concept of truth and its philosophical function as well. The skeptical Academy took these principles as the premises of an argument in which the Liar Paradox functioned as the conclusion. This suggests that the Liar Paradox was part of the controversy between realism and anti-realist skepticism in Greek philosophy.

Lucullus, who presents the dogmatic version of traditional Platonism, notes that the paradox was regarded by the skeptical Academy as unsolvable (*aropá*). This remark fits well with the approach of the skeptical Academy, since they did not consider the paradox a problem to be solved. According to the skeptical approach, the paradox was supposed to show that realism leads to a dead end, as a symptom to the internal inconsistency of the philosophical assumptions that led to its emergence. Cicero notes that one of the remarkable Stoic logicians, Chrysippus of Soli, failed to solve the paradox. The mere fact that he tried to solve it is important to the interpretation proposed here. If one chooses to adopt the premises leading to the paradox, then one must show why the argument is invalid for saving the premises (as will be discussed in section, 5.2 below). This fact coincides well with the fact that the skeptical Academy was in particular opposition to the realist philosophy of Stoicism. Stoicism turned out to be the leading philosophical school of the Hellenistic period while the Academy declined and lost its leading role. Arcesilaus of Pitane and Carneades of Cyrene, the Academy heads, saw the skeptical approach as the key to better competition with the success of Stoicism and the renewal of the Academy's central place in Greek philosophy³². The controversy was about the criterion of truth, which constitutes an important part of the criticism of the Stoic theory of knowledge. The use of the Liar Paradox by the skeptical Academy is to be understood in view of this fundamental philosophical controversy.

In this controversy Cicero sides with the skeptical Academy. The discussion of the Liar Paradox and others led Cicero to the following main conclusion. Dialectics, as it was used by dogmatic philosophers, is useless as a reliable tool for determining what is true and for distinguishing between the true and the false (II.91-98). Consequently, as Carneades argues, one must adopt the theory of plausibility, since otherwise rationality will become impossible. What the dogmatic think of as knowledge, is only verisimilitude in the eyes of the Academy skeptics (II.99-105). Cicero notes that even the Stoic philosophers had their doubts regarding the epistemological question of reliability and certainty. The Stoic Panaitius of Rhodes, for instance, doubts "the truth the pronouncements of diviners, of auspices and oracles, of dreams and soothsaying". Although a Stoic, he clearly abstains from passing judgment on these matters (II.106-107). However, a person who plans her actions according to plausibility has all the possibilities open for her to act (II.108-109). The dogmatic philosophers claim that only they know the truth, but their students accept what they are taught uncritically and see themselves as obligated to believe it without any further investigation. The philosophers of the Academy, on the other hand, are free to look for the truth without any restriction, and they can examine freely which of the claims is the closest to the truth - the most plausible (II.7-9). It does not follow from the claim that there is no certain knowledge, but only plausibility, that people cannot act in practical life. The difficulties in epistemology exist only for the theoretical mind and not for the practical one, as plausibility is sufficient for practical actions. People, guided by the practical mind and sense perceptions, can give affirmative or negative answers to practical questions (II.104, cf. 61). Even the assumption that nothing can be known is considered by the Academic philosophers as only a plausible claim and not as an absolute truth (II.110). Furthermore, the correctness of skepticism is affirmed by the differences that exist between the opinions of philosophers, as each of them claiming that only he knows what is true (II.115). This is the case in the philosophy of nature (II.116-128), ethics (II.128-141), and epistemology (II.142-146). This criticism is attributed to Antiochus, who argued that there is conformity among Platonism, Aristotelism and Stoicism. Cicero ends his speech in observing that in view of the contrasting philosophical theories that exist among distinguished philosophers, it is impossible that only one philosophical theory can be true while all the other known philosophical theories must vanish (II.147).

The Liar Paradox should be understood against the background of this central philosophical controversy. It was used then as a part of an epistemological and metaphysical argument and had a clear negative philosophical purpose - that of refuting realism³³. A fundamental distinction in Greek philosophy was that between the phenomenal, as it appears (*pháinesthai*) to the senses, and the real or actual (*péphuke*). The skeptics argued that there is no way to establish a reliable and undoubted relation between sense perceptions (*aísthesis*) and reality. Thus they distinguished between what is seemingly true, based on sense perceptions, and what is true (*aléthés*) in the realist and objective sense, namely, exists in the real world. The Liar Paradox was part of a negative move for establishing the inaccessibility of realist truth. It was thus not considered as a problem in need of a solution, but as part of a *Reductio ad Absurdum* argument that has destructive consequences for realist epistemology and metaphysics.

The rest of the evidence to be discussed here supports this story of the Liar Paradox in Greek philosophy.

3. The Greek concept of truth is a realist one

According to the proposed story, the realist concept of truth is the target of the Liar Paradox destructive force. Consequently, the exact meaning that Greek philosophy assigned to the concept of truth is important for understanding the skeptical context in which the paradox was formulated.

The meaning of the word 'truth' in modern philosophy varies from one theory to another. In classical Greek philosophy, the word 'truth' (*alétheiâ*) explicitly designated only the realist meaning. It was understood as constituting a correspondent relation between language and objective reality, namely that a sentence is true if and only if it describes the objective world correctly. Reality had the sense that what exists (*einai* or the real world *eteós* or *prâgma*) exists in an objective and autonomous way and its existence does not depend on the knowing subject or his perceptions³⁴. This realist concept of truth is the focus of the criticism offered by Greek skeptics. Thus, when they discuss the rejection of the possibility of knowing the truth, this should be understood as applying only to the realist conception of truth. The various skeptical schools are united in the claim that realist truth cannot be known and is thus inaccessible. They disagreed only on the question of whether another concept of truth is conceivable at all and, if so, then which one. In this sense, modern anti-realism is not in opposition to skepticism, but is a ramification of the Greek skeptical project. This is the perspective in which the skeptical arguments in Greek philosophy, and the Liar Paradox in particular, should be evaluated.

3.1 The Aristotelian concept of truth is a realist one

One of the main targets of Greek skepticism is undoubtedly Aristotle, as he was the first to explicitly define the concept of truth and its philosophical background and presuppositions. One of the main issues raised by Aristotle in the *Metaphysics* is the ontological question about objective reality, whose existence does not depend on the knowing subject. It is the ontological issue of existence or being in itself (*on e ón*), and the beings that exist (*ta ónta*), which are the basis for truth and knowledge. Aristotle introduces the realist concept of truth in Greek philosophy as follows:

This will be plain if we first define truth and falsehood. To say that what is is not, or that what is not is, is false; but to say that what is is, and what is not is not, is true; and therefore also he who says that a thing is or is not will say either what is true or what is false³⁵.

This definition presupposes at least two assumptions that are necessary for any formulation of a realist concept of truth. The first involves the nature of the truth-bearers and the second the relation of correspondence, and the two are interwoven.

3.2 Two presuppositions to the realist concept of truth

The first necessary presupposition deals with the identity of the truth-bearers. Aristotle explicitly assigns the truth predicate to mental entities, such as thoughts, and their linguistic expressions. He rejects the possibility

that truth is to be located in extra-linguistic objects or in the world and its states of affairs³⁶. He is also aware of the possibility that linguistic expressions (*apophantikós*) may change from one speaker to another, and that the representation of meaning by linguistic expressions is subject to human conventions (*kata sunthéken*). Consequently, linguistic expressions themselves cannot be used as the primary truth-bearers. Aristotle argues, however, that this linguistic variety conceals uniformity at a deeper level: Language expresses thoughts and thoughts relate to states of affairs or facts³⁷. The relation between thoughts (*noémata*), as mental entities, and states of affairs is fixed and based on the relation of similarity (*omoíomata*). In this way, the thought becomes the primary truth-bearer. Language expresses thoughts, and therefore linguistic expressions are only secondary truth-bearers. The truth-values of linguistic expressions are derived from the thoughts they represent. In this way, the truth-values of linguistic expressions are indirectly derived from the relation between the thoughts they represent and the states of affairs in the world³⁸. Moreover, Aristotle focuses his discussion on descriptive sentences (*apóphansis* or *lógos apophantikós*), distinguishing between them and other meaningful expression that do not have truth-value, such as prayers³⁹. The Aristotelian theory of truth thus focuses only on linguistic entities that can describe reality in the realist sense⁴⁰. Furthermore, Aristotle distinguishes between a proposition and its components. The components, such as nouns and verbs, are important, but they lack truth-value⁴¹. Only the complete sentence has a truth-value, since only it represents a proposition or a thought, which is the primary truth-bearer. The realist framework that focuses on truth is what gives philosophical importance to the Aristotelian distinction between a proposition and its components. If this distinction is correct, then the first necessary condition for the Aristotelian theory of truth is the identification of the truth-bearers, that is, the commitment to a continuum one end of which is the thoughts that are expressed by language, while the other is the reality that is described by them⁴².

The second necessary presupposition of the realist concept of truth for Aristotle, which is also indirectly necessary for the identification of the truth-bearers, is the claim about the relation of correspondence. Aristotle was well aware of this necessary dependence, as he says:

And so,...the truth of propositions consists in corresponding with facts⁴³.

Moreover, the realist concept of truth given by Aristotle is basically a semantic concept (in modern terms):

Now every proposition (*katáphasis*), like an affirmative proposition (*pásis*) predicating something of something, is true or false⁴⁴.

Aristotle formulates the correspondent relation as a one between thoughts, which are expressed by language, and extra-linguistic entities; in this relation the linguistic expressions (*legómena*) signify (*semáíbei*) the extra-linguistic entities. It is thus an objective relation that does not depend in any essential way on the knowing subject.

This formulation enables Aristotle to distinguish between an ontic and semantic relation. Ontic relations exist among extra-linguistic objects. The objects and the relations among them are given in objective reality, without any connection to the linguistic domain and without any dependence on the knowing subject⁴⁵. This is the sense of an object in itself (*tôn ónton*). This is where the relation of "being in an object" (*ev tivi éinai*) belongs, and this relation exists between objects in themselves and their predicates or properties. Semantic relations, in contrast, occur between linguistic expressions and extra-linguistic entities. This is where the relation of 'being a predicate of an object' (*kata tivós légesthai*) belongs. This relation exists between the name of an object and the object in itself, and between the name of a predicate and the occurrence of this predicate in the object. The truth of a proposition denotes a semantic relation, and it is based on the existence of the corresponding ontic relation. The knowing subject has no part in constituting these relations.

This meaning of the realist correspondent relation constitutes the realist concept of truth. This was evidently the assumption in Greek philosophy regarding this concept. Sextus Empiricus, for instance, is not suspected of adopting the realist concept of truth or the realist viewpoint. However, when he describes his starting point for his discussion of the criterion for truth and knowledge, the concept he is referring to when he uses the word 'true' (*alétheia*) is unmistakably the realist one. It presupposes the objective relation of correspondence⁴⁶.

This starting point is an echo of the semantic definition Aristotle gives to the concept of truth.

The realist concept of truth, as Aristotle defines it, is clearly a metaphysical concept. This is not surprising in view of the fact that he did not distinguish at all between logic, semantics and metaphysics, as some modern philosophers and logicians do. It is also evident from the two main sources where Aristotle discusses the concept of truth. The first source is *Metaphysics*, which interfaces smoothly and coherently with the discussions in the second source, the *Organon*, which deals with more logical and semantical issues. However, the *Organon* itself begins with the *Categories*, which is a metaphysical work. This characteristic decisively influences our understanding of the Liar Paradox⁴⁷.

3.3 The principles of logic as part of the realist concept of truth for Aristotle

Aristotle combines his metaphysical discussion of the concept of truth with logical principles, such as the principles of contradiction and the excluded middle. There are two reasons why he sees these principles as an essential part of the concept of truth. On the one hand, they control the functions of the truth-bearers, and on the other, they tell us how to describe reality in its objective sense. In other words, these principles are woven into the semantic and the ontic components of the concept of truth, and thus are necessary conditions for constituting the metaphysical meaning of the realist concept of truth. This understanding contrasts with a prevailing trend in modern philosophy, which sees the logical principles as formal and at times even meaningless or schematic principles that are only part of specific logical systems. However, the connection between the realist meaning of truth and these principles has raised complex conceptual difficulties in Greek philosophy. Aristotle himself was well aware of some of these, such as the status of the principle of bivalence regarding contingent propositions describing future events. The relevant fact here is that the formulations of these principles are given by Aristotle as an integral part of his metaphysical discussion, and are deeply interwoven into his general discussion of the concept of truth. The following sections bring some formulations of Aristotle's, which exemplify this⁴⁸.

A. The Principle of Contradiction⁴⁹

(1)Clearly, then, it is a principle of this kind that is the most certain of all principles... "It is impossible for the same attribute at once to belong and not to belong to the same thing and in the same relation"... This is the most certain of all principles, since it possesses the required definition; for it is impossible for anyone to suppose that the same thing is and is not... and [if] an opinion which contradicts another is contrary to it, then clearly it is impossible for the same man to suppose at the same time that the same thing is and is not; for the man who made this error would entertain two contrary opinions at the same time. Hence all men who are demonstrating anything refer back to this as an ultimate belief; for it is by nature the starting-point of all other axioms as well⁵⁰.

(2)[T]he most certain of all beliefs is that opposite statements are not both true at the same times... And since the contradiction of a statement cannot be true at the same time of the same thing, it obvious that contraries cannot apply at the same time to the same thing⁵¹.

(3)By demonstrative I mean the axioms from which all demonstration proceeds, e.g. "everything must be either affirmed or denied," and "it is impossible at once to be and not to be" and all other such premises⁵².

B. The Principle of the Excluded Middle⁵³

(4)Nor indeed can there be any intermediate between contrary statements, but of one thing we must either assent or deny one thing, whatever it may be⁵⁴.

(5)[A]nd so we must argue from a definition, having first grasped what "falsehood" or "truth" means. And if to assert what is true is nothing else than to deny what is false, everything cannot be false; for one part of the contradiction must be true. Further, if everything must be either asserted or denied, both parts cannot be false; for one and only one part of the contradiction is false⁵⁵.

C. The Principle of Bivalence

(6) We call propositions those only that have truth or falsity in them⁵⁶.

Two conclusions from these formulations are important to the present issue. First, these principles are unmistakably metaphysical. This conclusion is evident in light of Aristotle's constant move between the semantic and the ontic relations in the various formulations he offers for these principles. He does not distinguish between a formulation that refers to propositions and their linguistic expressions (the semantic relation), and one that refers to entities in the world and the relations between them (the ontic relation). The move between the ontic and the semantic becomes possible and legitimate only in view of the metaphysical nature of the correspondent relation. The second conclusion is that the principles necessarily presuppose the realist concept of truth, such that their meaning is constituted by this concept. There is no adequate understanding of their meaning and justification without first presupposing the realist concept of truth. For instance, when Aristotle formulates the principle of the excluded middle (formulation 4), he immediately argues that this definition is evident only if truth and falsehood are defined first:

This [the principle of the excluded middle] will be plain if we first define truth and falsehood⁵⁷.

Then comes the realist definition that was cited above.

3.4 Early criticism of the realist concept of truth in Presocratic philosophy

Aristotle gives a detailed analysis, and consequently a definition, of a notion that was common in Greek philosophy from its beginning. The germ of the doubts about the realist concept of truth can already be found in Presocratic philosophy. Even then, the skeptical claim that humans are incapable of knowing the truth was widely held⁵⁸. The critical assertions of the Presocratic philosophers indicate clearly that they discussed the issue of the accessibility of realist and objective truth, rather than any other concept of truth. However, no explicit formulation of the realist concept of truth has survived Presocratic period, and there is no indication such a well-defined philosophical concept existed at that time. The reason may be that the concept and its exact meaning were well-known and thus in no need of citation. In any case, the critical assertions of some of the more important Presocratic philosophers in the skeptical tradition cannot be understood without explicitly presupposing the realist concept of truth. Two examples will be sufficient to illustrate this point.

The first assertion is due to Democritus of Abdera, who is important for the following because of his

responsibility for the early formulation of the Principle of Equivalence or the principle of *Ou Mallon* (see 6.2, below). He argues that

We know nothing of reality [*ètehé*]; for truth lies in an abyss. [68B117]⁵⁹

This assertion can have a consistent meaning only if the realist concept of truth, and the known difficulties that are implied by its being a transcendental concept, are presupposed in the background. The metaphor of truth being in an abyss is similar to Hilary Putnam's metaphor of "from the God's-eye point of view". Both metaphors deny the possibility of knowing the truth and our ability to obtain reliable knowledge in a realist sense. Without these presuppositions in the background, the citation from Democritus becomes cryptic, nearly mystical.

Another proponent of skepticism is Xenophanes of Colophon. He explicitly argues for the fundamental limitations of knowledge in its realist sense. He argues that there are things that no human being can know or even know about:

And as for certain truth, no man has seen it, nor will there ever be a man who knows (*eidôs*) about the gods and about all the things I mention. For even if he should actually succeed to the full in saying what is completely true, he himself nevertheless does not know. But for all there is belief (*dókos*). [21B34]⁶¹

Xenophanes does not reject the possibility of knowledge in principle, but only reject the possibility of a certain sort of knowledge. The positive aspect of his epistemological criticism is that knowledge (*eidôs*) and certain

truth should be replaced by belief (*dókos*) and verisimilitude. These should be the goals of human inquiry:

Let these things be believed (*dedoxasthō*) as being similar to what is true. [21B36]

In other words, there is a sort of an unattainable and inaccessible knowledge, namely the realist sort. However, this should be replaced with another sort of knowledge, more attainable and accessible, although more subjective and relativist one, *i.e.*, a sort of anti-realist epistemology. This double move, *i.e.*, rejecting of realism and adopting anti-realism, is characteristic of late Greek skepticism. Most notable for executing this double move is Carneades of Cyrene of the middle Academy, with his theory of plausibility (*pithamós*). Now, if the word 'truth' in Xenophanes is not confined to its realist meaning, his discussion becomes unclear.

There are more examples of this kind of skeptical criticism of the realist concept of truth in Presocratic philosophy. They all share the assumption that the word 'truth' designates only the realist meaning. This assumption is necessary for constructing a reasonable interpretation of their philosophy; without it the fragments become obscure and unintelligible. The distinguished trend of skepticism in Presocratic philosophy is characterized by various arguments which were later adopted and elaborated by the schools of Greek skepticism. Most notable in introducing arguments against conventional opinions is Zeno of Elea. He was the first to use paradoxes as *Reduction ad Absurdum* arguments aimed at refuting a given opinion. This style of argumentation was later adopted by philosophers aiming at refuting the realist viewpoint, and one of the paradoxes that was used for this is the Liar Paradox. The realist concept of truth was the philosophical opinion that was referred to by the use of the word 'true' in the Liar Paradox. Now we can see how this concept developed both historically and argumentatively.

4. The Liar Paradox as a *Reductio ad Absurdum* argument

Even though Aristotle presented the first full-developed theory of realism, he was still well aware of the immense difficulties that the realist concept of truth faces. This fact is evident from the various connections in

which his many formulations of the logical principles appear. Some of his formulations of the principles of contradiction and the excluded middle appear in his discussion of the possibility that there are descriptive sentences that are neither true nor false, such as future contingent sentences. This kind of problem also appears in Aristotle's discussion of the problematical principle of bivalence⁶².

4.1 The first indications of the problem of the Liar Paradox before Aristotle

Difficulties of this sort are, according to the proposed interpretation, the philosophical background for the formulation of the Liar Paradox. The philosophical discussion in the fifth century BC on the details of the realist viewpoint philosophically highlighted the difficulty of constructing a coherent synthesis of the conditions for the realist concept of truth.

One piece of evidence for this difficulty is the discussion of the realist concept of truth in the dialogue *Euthydemus*. As was noted, above, Plato was not aware of the Liar Paradox, but he clearly acknowledged the problematic nature of the realist concept of truth. The brothers Euthydemus and Dionisodorus, the speakers in this dialogue, assert that there cannot be a false proposition. The main stages in their argument are as follows: The meaning of a proposition is acquired from its being a description of a given state of affairs. Accordingly, if a false proposition does have a meaning, then it must refer to some state of affairs. Thus, if one can indicate this state of affairs, then this proposition must be true. Therefore, if a given proposition does have a meaning, it cannot be false. This conclusion, however, evidently presupposes a kind of a realist concept of truth in the background, although much simpler than the one formulated by Aristotle⁶³.

This counter-intuitive conclusion and its philosophical background are discussed at length in the commentaries on Plato's work. There is further evidence of this sort of philosophical discussion, in places such as the writings of Prodicus of Ceos and Antisthenes of Athens. Their discussions clearly indicate the difficulties necessarily faced by the realist concept of truth, but they are not mentioned much in the literature.

These two sources discuss the soundness of the *Euthydemus* counter-intuitive conclusion. This conclusion is important, since an argument very similar to one half of the Liar Paradox can be extracted from it. Consequently, these testimonies suggest when the problems underlying the Liar Paradox may have emerged, dating them to the second half of the fifth century BC.

In one of the fragments attributed to Prodicus, he is said to have asserted that contradiction is impossible, and it is explicitly stated that this is a paradox:

To Prodicus is attributed a paradoxical opinion: it is not possible to speak in contradiction⁶⁴.

Not much is known about the details of the argument that are supposed to imply this conclusion. However, this counter-intuitive conclusion is also attributed to Antisthenes of Athens, and this evidence supports what is known about Prodicus:

"Contradiction is impossible", as Antisthenes said⁶⁵.

Antisthenes derives this conclusion from a specific realist theory of truth, which he shares with Euthydemus and Prodicus. According to Aristotle, Antisthenes' theory of truth gives a particular content to the abstract and schematic relation of correspondence. Antisthenes argues that there is a one-to-one relation between a proposition and a given state of affairs, which is similar to the relation between a proper name and a given object in the world⁶⁶. Indeed, there is no sense in contradicting a proper name even in modern logical systems. Diogenes Laertius notes:

He [Antisthenes] was the first to define a statement (or assertion) by saying that a statement is that which sets forth what a thing was or is⁶⁷.

Every proposition denotes a definite state of affairs. According to Aristotle, the conclusion that contradiction is impossible is based on the following reasoning.

- Premise (1)* The relation between a state of affairs and a proposition which describes it is identical to the denotation relation between an object and its proper name.
- Premise (2)* Every true proposition denotes a state of affairs in the world.
- Premise (3)* Only propositions that denote states of affairs in the world are meaningful, just as only proper names that denote objects in the world are meaningful.

Several corollaries follow from these premises:

- Corollary (1)* If it is possible to contradict a true proposition, there are three options: (1) The contradicted proposition denotes exactly the same state of affairs that is denoted by the true proposition. (2) It denotes another state of affairs. (3) It does not denote any state of affairs.
- Corollary (1.1)* If the contradicted proposition denotes exactly the same state of affairs, then it is identical in its meaning to the original true proposition, which is absurd.
- Corollary (1.2)* If the contradicted proposition denotes another state of affairs, then it is not the contradiction of the original true proposition, but another meaningful and true proposition.
- Corollary (1.3)* If the contradicted proposition does not denote any state of affairs, then it is meaningless according to the premises.

Given the above premises and their corollaries, the conclusion is as follows:

Conclusion: Contradiction is impossible.

What Prodicus' and Antisthenes' intentions were in constructing this counter-intuitive conclusion are unknown. One thing, however, is clear: The emergence of such a counter-intuitive conclusion should induce doubts about the realist framework that made the inference possible. If this conclusion is taken seriously and literally, then the assumptions presupposed by realism turn out to be meaningless or otherwise false. The inference of this conclusion should be taken seriously, since it is a conclusion of a valid argument, whose assumptions are part of a specific correspondence theory of truth. The outcome can thus be a reason for rejecting the truth of these assumptions and the specific content Prodicus and Antisthenes assign to the correspondence theory of truth. This way of interpreting the philosophical consequences of their work is compatible with the philosophizing that took place at the later stage of Greek skepticism: showing how the necessary presupposition of realism implies doubtful consequences. An important part of this interpretation is that the above argument can be used as a guideline for constructing another argument. The new argument remarkably resembles one half of the Liar Paradox argument, which functions as yet another reason for doubting the acceptability of the realist viewpoint. The argument, which is based on Antisthenes' reasoning, is given on the left side of the following table, while its possible resemblance to one half of the Liar Paradox is given on the right.

<i>The argument based on Antisthenes' reasoning</i>		<i>One half of the Liar Paradox</i>
(1) <i>Premise</i>	Suppose that the proposition 'Contradiction is impossible' is meaningful and true.	Suppose that the assertion 'I am lying' is true
(2) <i>Corollary</i>	According to the theory of truth discussed by Antisthenes, the sentence 'Contradiction is impossible' is true if and only if the state of affairs is that contradiction is indeed impossible. This has to be the case just as with any other true but unquestionable instance of the correspondent relation. For instance, the sentence 'Grass is green' is true if and only if grass is green.	According to the correspondent relation, the sentence 'I am lying' is true if and only if I am lying.
(3) <i>Corollary</i>	If it is the case that contradiction is impossible, then no sentence that refers to contradiction can be meaningful in any way. Therefore, the proposition 'Contradiction is impossible' is meaningless, since it refers to some characteristic of contradictions, and consequently, according to Antisthenes, it is false as well.	If the case is that I am lying, then what has been asserted is a lie, and consequently, it is not true that I was lying.
<i>Conclusion:</i>	If the proposition 'Contradiction is	If the assertion 'I am

impossible' is meaningful and true, it is meaningless and thus false.

lying' is true, then it is false.

The argument on the left greatly resembles one half of the reasoning behind the Liar Paradox, as shown on the right. The second half of the Liar Paradox does not evolve from Antisthenes' discussions, since the proposition that contradiction is impossible is consistent with respect to their viewpoint, namely, if it is meaningless it is false as well. The result is that the paradoxical way of arguing that distinguishes the Liar Paradox is hidden in the discussions of Euthydemus, Prodicus and Antisthenes and is a consequence of the specific content they give to realism. Although there is no evidence that they actually engaged in such a discussion, it is clear from the above resemblance in argumentation that the philosophical atmosphere was ready for such a discussion.

The main point is that this kind of argument can be used as a refutation of the theory of truth suggested by Prodicus and Antisthenes. Although their conclusion is not a full paradox, it obviously raises substantial doubts for their version of a realist theory of truth. Their version of the correspondence theory of truth is known today to be inadequate. Other ways of constructing much richer theories of truth are known today as well, in which falsehood is possible and legitimate. Aristotle suggested such a theory, which deals with the metaphysical, logical and semantic nature of predicates and objects in describing the correspondence concept of truth⁶⁸. However, the relevant conclusion here is the fact that the realist concept of truth has counter-intuitive implications and this was already known in the fifth century. This tension gave rise to a variety of realist theories of truth, most notably these of Plato, Aristotle, Epicurus and Stoicism. It also explains the philosophical function of the Liar Paradox in Greek philosophy.

4.2 The formulation of the Liar Paradox

Discussing the premises that produce the Liar Paradox is the next stage in the speculation or story regarding its philosophical function in the Megarian School. The formulation of the paradox by the Megarians is probably close enough to the version given by Aristotle or at least close to it in its essence⁶⁹. The Megarian version of the paradox is as follows:

when somebody asserts "I am lying", he is at the same time telling the truth and lying⁷⁰.

A necessary condition for the emergence of the paradox is that the Liar sentence 'I am lying' is a legitimate truth-bearer according to Aristotle. This sentence indeed satisfies all the requirements for a factual proposition (*lógos apophantikós*). Given this, the paradox is generated as was described above in the *Introduction*. The function of the realist viewpoint can be seen now more clearly. The generation of the paradox presupposes the realist concept of truth as defined by Aristotle, *i.e.*, what is said by a true sentence must also be the case and vice versa. The Aristotelian principle of the excluded middle is presupposed for the equivalence between 'not false' and 'true', and the principle of contradiction is presupposed for deducing that the conclusion of the paradox is self-contradiction and thus a logical absurdity⁷¹. The absurdity produced is therefore a logical consequence of the necessary conditions for realism. These conditions are the correspondence concept of truth and the logical principles that govern it. This way of formulating the paradox with its explicit reference to the realist principles as the premises of the argument, is not merely a modern construction. It is very likely the way the Megarians themselves saw it.

4.3 The inquiry method of Eubulides of Miletos and the Megarian School: dialectics and the use of *Reductio ad Absurdum*

The interpretative problem regarding the Liar Paradox is that beyond the testimonies about Eubulides and the Megarian School⁷², we do not know very much to help explain the function of paradoxes such as the Liar Paradox in Greek philosophy of the fourth century. The next step in the proposed story is to examine the relevant aspects of the Megarian School that led to the paradox. In this way, the proposed story will connect all the known facts about the Megarian School into one scenario⁷³.

It is known that many paradoxes, including the Liar Paradox, were first correctly formulated by the Megarian

It is known that many paradoxes, including the Liar Paradox, were first correctly formulated by the Megarian School. They took an important part in their philosophical discussions. The Megarian School is known also for the adoption of dialectics as the main philosophical inquiry method⁷⁴. The common epithet of the school and of some of its members was 'the dialectician' or 'the refuter'⁷⁵, meaning the use of the *Reductio ad Absurdum*⁷⁶. They had a reputation for involvement in philosophical controversies (*erismoû*) and producing refutations of philosophical claims. According to Diogenes Laertius, Euclides and others members of the school criticized philosophical arguments not by criticizing their premises, but by criticizing their conclusion

according to the *Reductio* form⁷⁷. One member of the Megarian school, Alexinus of Alis, was known by the epithet 'the refuter' (*Élegxinos*)⁷⁸.

The Megarian school is further known for developing a logic of propositions that was entirely different from the Aristotelian predicate logic, and was a source for the great logical achievements attributed to Stoicism. Three important philosophers who are known for having developed original ideas in dialectics and logic were members of the Megarian school: Eubulides, Diodorus Cronus of Iasus and Philo of Megara. However, only one important philosopher from the Stoic school is known for original thinking on logical matters: Chrysippus of Soli. Besides logic, the Megarian School is known for its philosophical ties with the metaphysics of the Eleatic school. The school was influenced by Parmenides' metaphysics and the dialectics of Zeno of Elea, who defended Parmenides' metaphysics with dialectical arguments and paradoxes⁷⁹. These may seem to be a random collection of facts, but connecting them will provide the key to the philosophical function of the Liar Paradox.

The main point is to see the connection between the paradoxes' role in dialectical methodology and their function in metaphysical inquiry. The key is the concept 'dialectics' in fourth-century Greek philosophy⁸⁰. According to Aristotle, "dialectics" is a collective term for argument forms that were designed for examining the truth-value of premises, which are not necessarily true or evident⁸¹. One of the examples that were present before Aristotle's analysis was the Platonic dialogue⁸². Plato classified assumptions whose truth-values are to be dialectically investigated, as 'hypotheses'. According to his dialectical method, hypotheses are examined by questioning the adequacy of the conclusions derived from them. If the conclusion is impossible, the hypothesis from which it was derived is rejected. Aristotle notes that the *Reductio ad Impossibile* argument form is a kind of derivation 'ex hypothesi' and summarizes this kind of hypothetical argument as follows:

Everyone who carries out a proof *per Impossibile* proves the false conclusion by syllogism and demonstrates the point at issue *ex hypothesi* when an impossible conclusion follows from the assumption of the contradictory proposition. *E.g.*, one proves that the diagonal of a square is incommensurable with the sides by showing that if it is assumed to be commensurable, odd become equal to even numbers. Thus he argues to the conclusion that odd becomes equal to even, and proves *ex hypothesi* that the diagonal is incommensurable, since the contradictory proposition produces a false result. For we saw that to reach a logical conclusion *per Impossibile* is to prove some conclusion impossible on account of the original assumption⁸³.

There is no prior acceptance of the truth-value of the hypothesis in the use of the *Reductio ad Impossibile*, only the prior agreement to reject it based on the success of the argument. The reason for this, according to Aristotle, is "because the fallacy [of the conclusion] is obvious."⁸⁴ This philosophical methodology is therefore a negative one of refutation, the rejection of a hypothesis because of its impossible conclusion⁸⁵. Its logical form is as follows:

<i>A given argument:</i>	Given a set of premises D Therefore: the conclusion is: α
<i>A decision regarding the acceptability of the conclusion:</i>	But it is impossible that α

<p><i>The final conclusion, based on</i></p> <p>(a) <i>the given argument and</i></p> <p>(b) <i>the decision regarding the conclusion of that argument.</i></p>	<p>Therefore, not-D</p>
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The core of a proof by *Reductio ad Impossibile* is that "to reach a logical conclusion *per Impossibile* is to prove some conclusion impossible on account of the original assumption"⁸⁶. Given the traditional difference between *Reduction ad Absurdum* and *Reduction ad Impossibile*⁸⁷, the Liar Paradox should be classified as a *Reductio ad Impossibile*, since in this *Reductio* argument the conclusion is "either a refutation or a paradox"⁸⁸. For simplicity, however, this distinction will not be maintained in the following.

4.4 The *Reductio ad Absurdum* argument form

Regarding Megarian logic, the use of the argument form of *Reductio ad Absurdum* necessitates the use of logic of propositions, which defines in precise terms the logical behavior of hypothetical propositions. The Megarians had to develop such a logic in order to use dialectics, and it is known that the school and some of their pupils, who founded the Stoic school, were engaged in such inquiries⁸⁹. Various philosophers from the Megarian School were known for their logical and mathematical skills, such as the founder of the school, Euclides of Megara. Others were heads of the school, such as Stilpo of Megara, Diodorus Cronus of Iasus and Philo of Megara. From the little that is known about the last three it is evident that they had a genuine and deep understanding of some logical problems which are still unsolved and disturb modern logicians. The accepted opinion is that the source of the fundamental conceptual achievements of Stoic logic, as well as the basic principles of dialectics regarding entailment and refutation, is the logical work done by the Megarian School⁹⁰.

One interesting source for the analysis of the *Reductio ad Absurdum* argument form is an enigmatic passage found in the *Prior Analytics*⁹¹. It also shows the importance of the logic of propositions for the dialectical method developed by the Megarian School. This passage shows the tremendous difficulty of follow the dialectical method only with the aid of syllogistic logic. In this passage, Aristotle criticizes the *Reductio ad Impossibile* argument form as part of his discussion of the issue that a proposition and its negation cannot both imply the same conclusion⁹². The starting point for his discussion is the following argument form:

- | | | |
|-------|-------------------------------------------------------------------|------------------------------------------|
| (1) | Given that α , then it is necessary that β | Premise |
| (2) | Given that not- α , then it is necessary that β | Premise |
| ∴ (3) | Given that not- β , then it is necessary that not- α | <i>Contraposition,</i>
¹⁹³ |
| ∴ (4) | Given that not- β , then it is necessary that β | <i>Transitivity, 2,3</i> ⁹⁴ |

Aristotle claims, however, that conclusion (4) is absurd and impossible, and therefore premises (1) and (2) cannot both be true. However, he is surely wrong, since as long as ' β ' is a true proposition, (1) and (2) are consistent. The first question is why Aristotle thought that this argument criticizes the *Reductio ad Impossibile*. The answer is that lines (1) to (4) connect the following propositions:

- (a) Given that not- β , then it is necessary that not- α .
- (b) Given that not- β , then it is necessary that α .

From lines (a) and (b) one can move to lines (1) and (2) with the principle of Contraposition, and then derive the conclusion:

\therefore (5) It is necessary that β .

from line (4)⁹⁵. However, the argument whose premises follow the form of (a) and (b) and whose conclusion follows the form of (5) is a *Reductio ad Absurdum*. That is, if the hypothesis that not- β implies a contradiction (i.e., that α and not- α), then it is necessary that β . It turns out, then, that Aristotle is referring here to the *Reductio ad Absurdum* argument form, and in other words, to the dialectical methodology. However, this is a valid argument in propositional logic, as it was developed and used by the Megarian and the Stoic schools. Although it cannot be translated easily into a syllogistic form within Aristotelian logic, it is nonetheless valid.

The second question now arises: In what sense is this a criticism? It seems that Aristotle intended to reject this form of reasoning because it is absurd, but eventually gives valuable evidence for its validity. What can be learned from this passage is the formal proof of the validity of the *Reductio ad Absurdum*. Perhaps Aristotle's restriction to syllogistic logic was the source of his mistake, since propositional logic is needed for a full logical understanding of the *Reductio ad Absurdum*. In any case, Aristotle's treatment in this issue is a puzzle for scholars⁹⁶. The important thing for the present purpose is that a fourth-century testimony describes in detail some of the logic behind the dialectical method.

In the Megarian School, as in Greek philosophy in general, logic was not an independent and autonomous subject, but an integral part of philosophy and philosophical inquiry⁹⁷. The extensive investigations in logic by the Megarian School were an integral part of their metaphysical investigations and their dialectical methodology. A commitment to dialectics as a philosophizing method and an interest in metaphysics are interwoven in the formulation of the Liar Paradox by Eubulides. It was used as the conclusion of an argument whose contradictory nature leads to the refutation of the argument's premises⁹⁸. The paradox turns thus into an important philosophical insight, since the hypothesis which is questioned by the argument is, in its Platonic sense, a reasonable and acknowledged philosophical thesis.

4.5 The logical justification of the validity of the *Reductio* Argument

The proposed story about the Liar Paradox as part of a *Reductio* argument is further supported by analyzing its logical characteristics according to Megarian-Stoic logic. The logical basis for this refutation is given by Megarian dialectics, which can throw some light on its nature⁹⁹. An argument of the *Reduction ad Absurdum* form, such as the one discussed here, is one in which the truth of the premises is under dispute. The premises are agreed upon for the sake of establishing the conclusion, and their truthfulness is only stipulated or conditionally assumed¹⁰⁰. However, in view of the absurdity of the conclusion, the premises are rejected. This delicate logical move is justifiable in terms of Megarian-Stoic logic.

The whole logical point is that the dialectical move of refutation constitutes a valid argument that has a necessary false conclusion. According to Megarian-Stoic logic, an argument is valid (*sunaktílós* or *peravtikós*) when the conditional proposition with the conjunction of the premises as antecedent and the conclusion as consequent is true¹⁰¹.

The conditional proposition should be true according to Diodorus Cronus' definition of a true conditional, and in modern modal terms that means necessarily true¹⁰². The semantic corollary is that an argument is valid when the negation (*antikeímenon*) of its conclusion is inconsistent (*máchomai*) with the conjunction (*sumpeplegménon*) of its premises¹⁰³. This is, however, not a definition of validity, but only the criterion for validity. The point is that according to Megarian-Stoic logic, an argument of the *Reductio ad Absurdum* form is a valid but false argument (*pheûdos*); that is, a valid argument with a false conjunction of premises¹⁰⁴. It is clear that at least one of its premises is false because of the necessary falsehood of the conclusion.

According to Megarian-Stoic logic, the validity of any argument is justified formally by logical analysis. A given argument is reduced to a series of arguments built up from the five undemonstrated (*i.e.*, evident, *anapódeiktos*) argument forms. The arguments of the five fundamental types are called "undemonstrated", because they do not need to be demonstrated (*apodeiktikós*) "owing to its being immediately clear in their case that they are valid (*sunágousin*)" [105](#). The reason for also calling these arguments "simple" is that their conclusions "follow immediately from their premises". Sextus Empiricus introduces his discussion of the five undemonstrated arguments or inference-schemata (*schêma*) as follows:

... the undemonstrated arguments which the Stoics talk so much about... are the arguments which they say need no proof for their own construction and themselves serve as proofs of the validity of the other arguments... They envision many undemonstrated arguments, but they set out in particular the following five, to which all the rest are thought to be referred [106](#).

Sextus then lists the five types. He says, "and if they are rejected, the whole of dialectics is overthrown" and Cicero says that this series of undemonstrated argument forms or inference-schemes constitutes the whole of dialectics [107](#).

The Liar argument is founded on the falsehood of a consequent that was validity derived from a set of necessary presuppositions for realism, which in its turn is the reason for the rejection of the antecedent all together. This refutation move is primarily based on the second type of the undemonstrated arguments: [108](#)

$\alpha \supset \beta$	Sextus Empiricus: "That is, when an argument has two premises, of which the one is a conditional and the other is the contradictory of the consequent of the conditional, and also has as its conclusion the contradictory of the antecedent, then such an argument is a type two undemonstrated argument".
$\sim \beta$	
$\sim \alpha$	

This scheme is the basis for considering the Liar Paradox a part of a *Reductio ad Absurdum* refutation argument. The variable 'β' is replaced by the proposition that the sentence 'I am lying' can have a truth-value and 'α' is the conjunction of necessary conditions to realism. However, 'β' is necessarily rejected due to the Liar Paradox and the conclusion is that the set of conditions represented by 'α' cannot be consistent, and thus at least one of these conditions must be false. It is important to note that in the formulation of this scheme in the ancient texts it is stated that the consequent is contradicted (*antikeímenon*) and not just a negation (*apophatikós*) of a proposition. This gives more weight to the use of paradoxes as a basis for refuting the hypothesis in the antecedent. Otherwise, the consequent is nothing more than a contingent false proposition, which cannot constitute a full refutation move.

Given the validity of the Liar argument, the rational choice is clear as well. It is based on the third type of undemonstrated argument: [109](#)

$\sim(\alpha \wedge \beta)$	Sextus Empiricus: "Thirdly, the argument which, from a negative conjunction and one of the conjuncts, concludes to the negation of the other".
α	
$\sim \beta$	

Realism and the proposition that the sentence 'I am lying' can have a truth-value cannot be both true and cannot constitute a consistent set. The meaning is that one can infer the two contradictory propositions, *i.e.*, that the Liar sentence is true and that it is false, from assuming the truthfulness of realism. This situation is, as was shown above, the reason for eventually rejecting the truthfulness of realism. What is needed now is to show, according to Megarian-Stoic logic, the justification for the reduction of this argument to a series built up out of the five undemonstrated argument forms. In Megarian-Stoic logic the validity of an argument is shown

out of the five undemonstrated argument forms. In Megarian-Stoic logic the validity of an argument is shown through analysis. The "analysis" of an argument means the procedure of reducing a given argument to a series of the basic undemonstrated arguments. Megarian-Stoic logic had at least four general rules (*themata*) by which these analyses were supposed to be carried out. The basic justification for the validity of the Liar argument is the inference-schema "the argument from two conditionals" (*dià dúo tropikûn*):[111](#)

$\alpha \supset \beta$	Sextus Empiricus: "If the first, the first; if not the first, the first; either the first or not the first; therefore the first".
$\alpha \supset \sim \beta$	
$\beta \vee \sim \beta$	
$\sim \alpha$	

To form the refuting argument, 'α' has to be replaced by the conjunction of the necessary conditions for realism. The variable 'β' has to be replaced by the proposition that the Liar sentence can have a truth-value, *i.e.*, the sentence 'I am lying' is either true or false.

Assume for the sake of argument that this refutation move is acceptable. If so, then it is a discovery that a paradox was hidden in the realist doctrine all the time, as it is certainly not *prima facie* evident. A logical analysis of the internal connections between realism and the Liar Paradox was needed for exposing it. The Megarian and the Stoics were well aware that sometimes an act of exposing non-evident conclusions is needed. This constitutes one of the four general rules (*themata*) - the dialectical theorem (*theúrema*):

If we have premises, which yield a conclusion, then we have in effect also this conclusion among the premises, even if it is not explicitly stated.[115](#)

This rule, along with the other three, was used to prove the demonstrability of an argument. However, this rule has a special importance for the current discussion, since it is the reason for demonstrating the internal inconsistency of realism.

The dialectical conclusion that realism is internally inconsistent is certainly controversial. Assuming it is right, however, it certainly constitutes a "discovery" that was made possible by the use of logic. The conclusion is, however, not an evident one and is surely in need of demonstration. Megarian-Stoic logic distinguishes between valid arguments that have pre-evident conclusions, and others that have non-evident ones. Some of the valid arguments that have non-evident conclusions merely "proceed" to their conclusions (*ephodeutikûs*), but the Liar Paradox presents a more subtle case. The Liar argument is an example of an argument that, according to Megarian-Stoic logic, proceeds "by way of discovery". Logic and dialectics serve here to reveal a non-evident conclusion:

An argument, which by means of what is more clearly apprehended [*i.e.*, the undemonstrated five types], concludes that which is less clearly apprehended.

The Liar argument is a non-evident and non-simple argument that has to do with discovering something about realism. The above analysis of the argument into its components proves in Megarian-Stoic terms its validity and turns the refutation of realism into an evident conclusion.

4.6 Supporting evidence: The Paradox of Menedemus of Eretria

As was said earlier, there is no explicit and direct evidence that the Megarian School held philosophical discussions about the Liar Paradox. There is, however, indirect evidence that coincides well with the proposed interpretation here. The evidence is about a paradox formulated by Menedemus of Eretria, which has a striking similarity with the Liar Paradox. The way the paradox was formulated in the *Reductio ad Absurdum* form is known. However, what is more important is that the philosophical theory that was the object

of the criticism is also known.

Menedemus studied at the Megarian School and admired his teacher, Stilpo of Megara, the third head of the school¹¹⁶. Consequently, it is reasonable to assume that the following paradox of Menedemus was formulated and discussed according to the dialectical tradition that he studied at the Megarian School. The Menedemus paradox is:

When he [Menedemus] heard that Alexinus often praised him, he said 'And I'm always chiding Alexinus; so Alexinus must be a bad man, since he either praises a bad man, or is chided by a good one.'¹¹⁷

It is not the Liar Paradox, but the way it was generated and its paradoxical nature are similar to those of the Liar Paradox. In contrast to the Liar Paradox, however, the philosophical context in which this paradox was formulated by Menedemus is known. The first stage, therefore, is to see what theory was supposed to be refuted by Menedemus' paradox.

The background for the formulation of the paradox is a specific theory of correspondence; much similar to the theory advocated by Prodicus and Antisthenes¹¹⁸. Namely, that there is a one-to-one relation between simple or atomic propositions and facts, and so each proposition stands for itself as an autonomous unit of meaning and designation¹¹⁹. This theory is one of the meanings that can be assigned to the schematic relation of correspondence and the realist concept of truth. Furthermore, it is a legitimate candidate for a realist theory of meaning. The necessary conditions formulated by Aristotle for the realist concept of truth are schematic and general, and can thus conform to several correspondence theories of truth. The Menedemus paradox can now be shown as a *Reductio ad Absurdum* of this theory of meaning. The theory's consequences are used as premises for generating the paradox, just as was frequently done in the dialectical philosophizing of the Megarian School¹²⁰.

The sentences that constitute the paradox are "Alexinus is bad" and "Menedemus is good". They are paradigmatic instances of appropriate sentences according to the said theory: Atomic, simple and positive sentences that can maintain a rigid name \Rightarrow fact relation between language and reality. Menedemus' paradox is generated as follows: Menedemus asserts "Alexinus is bad" while Alexinus asserts "Menedemus is good". The assumption is that a good person praises only good people and condemns only bad ones, and

conversely, a bad person praises only bad people and condemns only good ones. Now, if Menedemus is good, then according to his condemnation of Alexinus it turns out that Alexinus is bad. If Alexinus is indeed bad, then his praise of Menedemus turns Menedemus into a bad person. Therefore, the first half of the paradox is 'if Menedemus is good, then he is bad'. On the other hand, if Menedemus is bad, then from his condemnation of Alexinus it turns out that Alexinus is good. If indeed Alexinus is good, then from his praise of Menedemus it turns out that Menedemus is good. Therefore, the second half of the paradox is 'if Menedemus is bad then he is good'. The conclusion, drawn from the conjunction of the two halves, is 'Menedemus is good if and only if he is bad'. This paradox is parallel to the Liar Paradox in the following formulation:

Menedemus: "Alexinus is lying".

Alexinus: "Menedemus is telling the truth".

If the argumentative form of Menedemus' paradox is applied to this pair of sentences as well, then the consequence will be 'Menedemus is telling the truth if and only if he is lying'.

By the use of the *Reductio ad Absurdum* Menedemus showed that the realist theory of meaning under discussion is inconsistent. The Menedemus paradox supports the proposed interpretation in two aspects: the philosophical nature of the Liar Paradox and its role in the refutation of realism.

In this way, the description given by Cicero in his *Academica* (see section 2, above) regarding the nature of the Liar Paradox and its function in late Greek skepticism agrees with much other evidence. If the above interpretation of the philosophical nature of the Liar Paradox and its role in the Megarian School is correct,

then the way to its assimilation in the later stages of Greek skepticism is short¹²¹.

5. Examining the proposed story about the Liar Paradox in Greek skepticism: attempts by realist philosophers to block or to solve the Liar Paradox

One of the best supports for the proposed interpretation to the Liar Paradox is the effort of philosophers with realist outlook to block or to solve the Liar Paradox. There are two parties to the controversy over realism. Namely, the Megarian School and late skepticism on the one hand, and the realist philosophers, such as Aristotle and Chrysippus of Soli, on the other hand. They differed in the way they discussed the paradox and understood its implications. Given any paradox formulated as part of a refuting argument, there are at least two opposing approaches:

(1) The first approach was held by the Megarian school and Greek skepticism in general. They used the paradox for pointing out an internal inconsistency in the realist outlook, implying necessary falsehood of some of the premises which entail it. It was constructed as such for exposing the inherent inconsistency in realism. The result is the rejection of realism, since all the premises needed to its emergence are necessary conditions. Therefore, the paradox is not a given problem that should be solved, but is an indication to the logical and rational necessity of rejecting at least one of the premises that lead to its emergence. Its formulation is the philosophical achievement.

(2) The second approach was held by philosophers with a realist outlook, such as Aristotle and Chrysippus. They faced the rational challenge of refuting their most fundamental presuppositions. If they chose to maintain the realist outlook, they had to find a way to invalidate the paradox. They had to focus on the paradoxical inference in order to find a flaw that would destroy its validity and rescue the threatened assumptions. In their view the philosophical achievement would be solving the paradox or showing why it is not a paradox after all. A reasonable justification for this approach can be, for instance, that realism has significant advantages that are independent of the question of the Liar Paradox.

In view of this distinction, a refutation test in the Popperian sense can be constructed for the proposed interpretation. The interpretation predicts that realist philosophers would attack the inference and try to show why it cannot be seen as a valid *Reductio ad Absurdum* argument after all.

5.1 Aristotle's solution of the Liar Paradox

Aristotle's discussion of the Liar Paradox is very brief, but it nonetheless contains one of the more impressive solutions. This discussion appears in *On Sophistical Refutations*, the last book in the *Topics*, which discusses invalid inferences¹²². It is part of the Aristotle's non-formal discussion of logic, dealing with various sorts of practical arguments. Aristotle's main claim is that the Liar Paradox should be classified in the category of fallacies. What is implied from his discussion is that no serious threat is involved since the Liar Paradox is no more than a fallacy that results from the faulty use of inference rules¹²³. The fallacy is created by an unrestricted use of concepts, that should be used only in a limited way, taking into consideration various factors such as context, place, time or relations between concepts¹²⁴. This kind of fallacy also appears in the context of ethics. There, Aristotle asks whether it is possible for a man to keep his promise and break it at the same time, and discusses the possibility of a man swearing to break his promise¹²⁵. Immediately after this, he claims that this situation is similar to that of the Liar Paradox:

The argument is similar which deals with the question whether the same man can say what is at the same time both true and false; but it presents apparent difficulties because it is not easy to see whether the qualification 'absolutely' should be applied to 'true' or to 'false'. But there is no reason why the same man should not be absolutely a liar yet tell the truth in some respects, or that some of a man's words should be true but he himself not be truthful.¹²⁶

Aristotle asks whether a man who asserts "I am lying" is uttering a proposition that is true and false at the same time. Aristotle assumes that it is a specific sort of fallacy, thus, providing a way of solving the paradox. It thus seems that the solution to the Liar Paradox according to Aristotle is based on the observation that not every use of the concept 'true' or 'false' is an absolute one. There are propositions, which can be true only in certain aspect (*mê*) or relations (*tinós*). That is, they are true for certain things but not absolutely true. In other, complementary aspects, they are false. On the other hand, such propositions can also be false in all their aspects.

In the modern view, Aristotle's analysis of the Liar Paradox is not considered a satisfying solution. Nonetheless, it is clear that Aristotle understood the importance of the problem as it was posed by the Megarian School. He notes that it is a difficult problem, which eludes any satisfactory solution. In light of this recognition in the importance of the problem, one may ask why Aristotle did not attempt to find a more comprehensive solution.

The Liar Paradox is not the only problem resulting from a realist theory of truth. For instance, Aristotle is aware of the problem of propositions with undetermined truth-value, as in future contingent propositions and the question of fatalism¹²⁷. He devotes an extensive discussion to this problem and proposes an analysis and a serious approach for constructing a solution. Some of Aristotle's insights are instructive for discussions of these problems even today. However, it is clear that there is no comparison between the philosophical scope and profundity of his detailed discussions of free will and fatalism and his scanty mention of the Liar Paradox.

There is no comparison between the serious solution proposed for the former problem and the faulty one proposed for the Liar Paradox. However, Aristotle's silence should be given as much philosophical importance as his attention. The problem he faced touches directly upon those logical and metaphysical principles that guide the behavior of the realist concept of truth, whose validity was evident to Aristotle.

5.2 Chrysippus of Soli's solution of the Liar Paradox

Chrysippus of Soli proposed the second known solution to the Liar Paradox in Greek philosophy. His solution, like that of Aristotle, focuses on finding a possible cause for the invalidity of the argument.

The [fallacy] about the truth-speaker and similar ones are to be... [solved in a similar way]. One should not say that they say true and [also] false; nor should one conjecture in another way, that the same [statement] is expressive of true and false simultaneously, but that they have no meaning at all. And he rejects the aforementioned proposition and also the proposition that one can say true and false simultaneously and that in all such [matters] the sentence is something simple [*i.e.*, a legitimate atomic proposition], sometimes expressive of more.¹²⁸

Chrysippus was a realist philosopher, and the Stoic theories of truth and meaning are realist in nature. Propositions are true because of their correspondence to objective reality, and like Aristotle, the Stoics had a list of necessary conditions for the realist concept of truth.¹²⁹

Given the realism advocated by the Stoics, it is clear why Chrysippus tried to find a solution that would prevent the emergence of the paradox, just as Aristotle had done. The solution Chrysippus proposed was to deny the legitimacy of the Liar sentence as a truth-bearer, claiming that it is a meaningless linguistic expression¹³⁰. Chrysippus explicitly rejects the possibility that the assertion of the Liar sentence is the assertion of a proposition which is true and false at the same time. This objection shows that Chrysippus, like Aristotle, was well aware of the destructive power of the paradoxical conclusion for the logical and metaphysical principles underlying realism. Chrysippus rejected the solution proposed by Aristotle, and it is reasonable to assume that this was due to Aristotle's clear failure to solve the problem.

However, according to the modern views of the semantic paradoxes, even Chrysippus' solution fails. The most similar modern solution is that proposed by Saul Kripke and Bas Van Fraassen¹³¹. This solution is based on the idea of "gaps" between truth-values and the idea of groundedness. However, like that of Chrysippus, this theory of truth do not constitute a conclusive and complete solution to the Liar Paradox. It is more *ad hoc*

solutions than genuine ones. Their only justification is the prevention of the paradox; they do not have any contribution of independent value to semantics.

This conclusion was clear to the ancient philosophers. Cicero notes that Chrysippus discussed various paradoxes, but did not succeed in solving them¹³². Cicero enumerates several difficulties in Chrysippus' solution. The common characteristic is that Chrysippus did not show why the Liar sentence is not a legitimate substitution in the correspondence relation. The fact that its substitution leads to a paradox cannot be seen as a reason to disqualify it as a legitimate truth-bearer. Without independent reasons for disqualifying the sentence, Chrysippus' solution is *ad hoc*.

5.3 An anonymous solution of the Liar Paradox

There is a third common reaction to the Liar Paradox, which is mentioned by Cicero and others. It is a response which says that the Liar Paradox is counter-intuitive; that it opposes the common intuitions about the use of the words 'true' and 'false'. This kind of rejection of the paradox is similar to the common rejection of other critical arguments of skepticism¹³³. For instance, the main response to Prodicus' opinion claim that speaking in contradiction is impossible is:

It goes against what all people believe and think, for all people have conversations in which they speak in contradiction, both in ordinary life and in doing philosophy¹³⁴.

Even Cicero, who should know better, concludes his *Academica* by saying that from now on philosophers should talk about positive issues. They should seek the truth instead of discussing the negative claims of the skeptics about the deception of the senses, the traps of the *soreítes* and the Liar Paradoxes¹³⁵. An overall rejection of skepticism because its critical claims conflict with ordinary intuitions is certainly not serious. Skepticism in general, and Greek skepticism in particular, do not oppose these intuitions. Pyrrhonist skepticism and the skeptical Academy explicitly argued that the skeptical criticism should not be understood as rejection of ordinary life and its constitutive beliefs. The subject matter of skeptical criticism is philosophical theories dealing with abstract metaphysical and epistemological issues¹³⁶. From the point of view of skepticism, realism is a philosophical theory which purport to teach about the true nature of reality, even if this reality is hidden. The philosophical target of the Liar Paradox is thus the metaphysical theory of realism and not the common use of the word 'true'.

The difference between the two approaches to the Liar Paradox is thus a *normative* difference: It involves the rational implications one is forced to accept due to the existence of a paradox. All the attempts to disqualify the Liar argument that were discussed above share a commitment to rationality, but this commitment is expressed differently depending upon the individual purposes of each of the figures. While skeptics conclude by claiming that realism is consistent, realists conclude by disqualifying some aspect of the argument. The difference, then, is the result of the difference in philosophical aims.

6. How skepticism understands the Liar Paradox, and in what sense it dissolves the paradox?

Cicero presents a metaphor was used by the skeptics, in which they compared the Liar Paradox to the story of Penelope, Odysseus' wife. Since Odysseus was long absent from his palace, one hundred and twenty idle suitors, convinced that Odysseus was dead, were lying siege to Queen Penelope, wasting his patrimony and eating her out of house and home. Penelope, being faithful to Odysseus, fought off the suitors. She said she could make no decision until she had finished weaving a shroud for Laertes, her father-in-law. For three years, she wove by day and unpicked the cloth by night.

The Liar Paradox is an argument and thus follows logic and truth-valued semantics. However, pure logical or semantical investigation of the paradox would miss the whole point. Just as the intention of Penelope's weaving was not to prepare a shroud, so the Liar Paradox was created for totally different purpose than is apparent at first glance. The Liar Paradox is a dialectical move with metaphysical aims. and thus

understanding it only as a fallacious argument misses the point. Furthermore, as it is clear that the paradox is not fallacious for the usual reasons, the question regarding the nature of its destructive force naturally arises. The perpetual unstitching of the cloth is an accurate symbol for the destructive force the paradox has for more than two thousand years. Every attempt to solve the paradox based on an examination of its features had led invariably to revisions of the paradox, which strengthened it as a perpetual obstacle confronting any realist concept of truth. The original Liar Paradox has many modern improved versions that make it almost hopeless for the realist to believe that it will ever be solved¹³⁷. In this sense, the Liar Paradox, like many other troublesome traditional skeptical arguments, is a refutation with epistemological and metaphysical implications. From this perspective, there is no sense in trying to find a solution to the paradox only on logical or semantical considerations. The paradox is not a given problematic fact, a semantical one in this case, which has to be solved. The more appropriate approach is one used in other general skeptical arguments. In this sense, the efforts of Aristotle and Chrysippus are similar to modern attempts to solve the paradox. They are unavailing in the same way as attempts to block the skeptical dream argument along logical or semantical lines, as if all there is in this argument is the misuse of logical principles or violation of semantical norms. In the perspective of skepticism the Liar Paradox ceases to be a problem in need of a solution, and turns into a challenge whose implications must be squarely confronted. It is no longer considered merely a fallacious argument for which the philosophical challenge is to find exactly why it is fallacious. In this respect, skepticism is an acceptance of the implications, and the acceptance constitutes its positive aspects, namely, the proposal for an anti-realist concept of truth and an appropriate epistemology.

6.1 Guiding principles for an anti-realist concept of truth in Greek skepticism

Greek skeptics, especially those in skeptical Academy, were not satisfied only with negative philosophizing, but also tried to develop positive proposals. As against the principles that constitute realism and its concept of truth, the skeptic philosophers introduced alternative anti-realist principles. Arguments such as the Liar argument were aimed at the rejection of realist principles, but at the same time indirectly supported and advanced anti-realist principles. Two of these anti-realist principles have a direct bearing on the implications of the Liar Paradox. The first is the Protagorean Principle of Equivalence, which is also known as the *Ou Mallon* principle. It states that there are cases in which judgment must be suspended due to the impossibility of determining the truth-value of contradictory propositions. The second principle is part of the sophist teaching of arguments and counter-arguments, part of their typical emphasis on the contradictory conclusions held by rival philosophical schools. This tradition is summarized in a work by an unknown author, entitled *Double Arguments* (*dissoí lógoi*).

The epistemological question that underlies the *Ou Mallon* principle and *Double Arguments* is whether truth in the realist concept is accessible. The skeptics' negative answer to this question constitutes a claim that the realist viewpoint cannot be maintained. Discussions of this question were prevalent in the skeptical Academy, providing a background for formulating and using the Liar Paradox. Skepticism offers constructive arguments that focus on showing the epistemological limitations of human knowledge, but those arguments are preceded by negative ones of the *Reductio ad Absurdum* form, which focus on refuting the basic assumptions of realism¹³⁸. The main consequence of these arguments is showing, from the point of view of realism itself, that there is an inconsistency inherent in the realist doctrine, and so the conceptual scheme of realism cannot be maintained.

However, can the Liar Paradox perhaps have destructive effects on skepticism as well? It should be remembered that powerful skeptic arguments can some times be reversed, so as to invalidate the doctrines held by those who formulated them in the first place¹³⁹. The two anti-realist principles of the *Ou Mallon* and of the work *Double Arguments* assure that this cannot occur with the Liar Paradox.

6.2 The Protagorean principle of Equivalence - The *Ou Mallon* Principle

The Principle of Equivalence is basic to the epistemology of Democritus and Protagoras, was later adopted by Greek skepticism¹⁴⁰. This principle states that for a given pair of propositions, '*p*' and '*q*', the epistemic

situation is 'Not (rather p than q)' or, more exactly, 'Not (rather p than q)' is compatible with ' q rather than p '. It denotes a sort of indifference or equivalence between ' p ' and ' q '. According to Aristotle's presentation of the principle, the human senses are at odd with one another in a variety of familiar ways, and the variations in sense experiences may well lead one to the following conclusion:

Thus it is uncertain which of these impressions are true or false; for one kind is no more true than another, but equally so. And hence Democritus says that either there is no truth or we cannot discover it. [68A112]¹⁴¹

Nausiphanes, a student of Democritus and teacher of Epicurus, rephrased his teacher's saying as follows:

On the things which seem to be, none is rather than is not. [75B4]

The intended use of the *Ou Mallon* principle is epistemological. It states the possibility of equivalence in the justification of logically contradictory propositions. Namely, one judgment is *no more* true than another if the evidence for each judgment is equally good. It is important to note that the *Ou Mallon* does not state that the two propositions are identical in every aspect. It only states that there is no way of determining which one is true and which one is false in the realist sense of truth and falsity. The reason this may happen is that human knowledge is limited and the senses are unreliable. If the truthfulness of a proposition cannot be supported conclusively, then belief in it cannot be justified. Therefore, its negation can be equally (un)justified. However, the *Ou Mallon* principle does not negate the principle of contradiction, and consequently it does not imply that one can rationally believe in a proposition and in its negation as true beliefs. The principle states that there are cases which are undecidable and nothing more.

6.3 Double Arguments (*Dissoi Lógoi*)

Another indication of the anti-realist stance is an anonymous work dated from the beginning of the fourth century, at about 400 BC, entitled *Double Arguments* or *Dissoi Lógoi*¹⁴². This work does not support a specific point of view, but examines theses and anti-theses or philosophical polarities. It is a sort of an exercise in demonstrating that there are two sides to every question. The debates presented in the work are similar to Protagorean teachings, which are said to have appeared in the *Art of Eristics* and two other books dedicated to the *Refutatory Arguments* by Protagoras:

[Protagoras] was the first to say that there were two contradictory arguments [*logoi*] about everything, opposite to one another. [80B6a]¹⁴³

The emphasis is on the arguments, or more generally, the reasons, for accepting or rejecting a given belief. Protagoras was known to be an acute arguer:

Protagoras says that on every issue it is possible for it to be argued with equal force on both sides. [80A20]

Aristotle naturally discussed the subject from the realist viewpoint. He was not the only realist to do so, however, as this tension pervades the controversy over the realist concept of truth. This tension was central to Greek philosophy from its beginning in the Presocratic period onward.

The text of the *Double Arguments* is incomplete but its content is fairly clear. Its main thesis is that contradictory propositions (*antilégein*) with comparable plausibility can be raised in various contexts. It is an example of the practice of relativism characteristic of the Sophists, as satirized by Aristophanes and Plato. Taken seriously, however, the work is a kind of instruction manual for ways of rejecting the possibility that realist truth is epistemologically accessible. It is in the Sophist, skeptical tradition of arguments and counter-arguments, of emphasizing contradictory conclusions held by philosophical schools, and of dual arguments for and against a given proposition. The relevant discussion for the present purpose occurs in Chapter Four, which deals with the failure to establish realist, objective, certain truth:

The fourth 'twofold argument' deals with true and false: that they are the same, and that they are different. [p. 420]

The fourth antinomy introduces a thesis and an antithesis: the realist and the anti-realist concepts of truth. The thesis is that the concept of truth is a realist one and is based on two main assumptions. The first assumption is that the concept of truth is a correspondent and objective one, since truth is a correspondence with an independent reality.

... the same statement is true or false according to whether it corresponds with the facts.

If reality is as described by a proposition, then this proposition is true, and if reality is different, then it is false. Furthermore, the concept of truth is objective:

So that the same words when falsehood is present are false, and when truth is present are true (just as a person is the same whether boy, youth, man or old man).

The truth-value of a proposition depends on its intrinsic falsehood or truth, rather than the epistemological limitations of human cognition. The second assumption is that the concept of truth is ruled by the principles of contradiction and the excluded middle. A proposition cannot be true and false at the same time, and it can only be true or false.[144](#)

This text is the starting-point for more advanced discussions of the possibility of an anti-realist concept of truth, one that would reject the total dependence of a proposition's truth-value on an objective state of affairs. The antithesis raised by the fourth antinomy is that truth is an anti-realist, relativist concept; accordingly, a proposition may be true in some contexts and false in others. The antithesis is introduced in an example taken from the law courts. It is insightful because it is not clear when the facts end and the description begins, and thus interpretation becomes essential.

If the things stated have actually happened, the story is true; if not, it is false. But the jury are examining, not the events (for they were not present) but the stories told of the events; so that the stories themselves differ according to whether truth or falsehood is mingled with them.

The principle of *Ou Mallon* and the *Dissoi Lógoi* thus belong to the positive aspect of Greek skepticism. Skepticism does not rule out in principle any possibility of deciding between two contradictory propositions and choosing the one rather than the other. It only rejects realist truth as a basis for a decidable epistemological procedure. If skepticism were an unrestricted and nihilist criticism against any concept of truth and decidability, then skeptics would not be able to offer any positive theory. However, Greek skepticism explicitly adopted anti-realist theses on subjective concepts of belief, evaluation, decidability and preference, and the possibility of justifying such epistemic acts.[145](#)

6.4 The Liar Paradox as a legitimate epistemological case of 'Suspension of Judgment' (*apoché*)

The concept of suspension of judgment (*apoché*) is one of the characteristics of the positive side of Greek skepticism. It is the rejection of realist truth and the choice of a concept of belief defined according to human nature and limitations. The idea of 'suspension of judgement' is the basic skeptic strategy of showing that positive beliefs about truths can be baseless and that there is no ground for claiming that something is known to be true. It is the epistemological situation of equipollence or the inability to decide between contrary claims. A skeptical argument against a given dogmatic claim is not intended to establish the truth of the counter-claim. Rather, the goal is to see why both claims are equally unsupported and why it is more reasonable to remain in suspension of judgment. Sextus Empiricus, probably the most authoritative source on the subject, defines the important ideas as follows:

By 'opposed accounts' we do not necessarily have in mind affirmation and negation, but take the phrase simply in the sense of 'conflicting accounts'. By 'equipollence' we mean equality with regard to being convincing or unconvincing: none of the conflicting accounts takes precedence over any other as being more convincing. Suspension of judgement is a standstill of the intellect, owing to which we neither reject nor posit anything.[146](#)

The anti-realist tendency of suspension of judgement regarding a claim to truth is the key to dissolving the Liar Paradox, since what is needed is a legitimate epistemological situation of disconnecting the claim that someone is telling the truth from the realist consequence that what was said must be the case. Sextus Empiricus explains what such a situation can be:

We use 'I suspend judgement' for 'I cannot say which of the things proposed I should find convincing and which I should not find convincing', making clear that the objects appear to us equal in respect of convincingness and lack of convincingness. Whether they are equal, we do not affirm: we say what appears to us about them, when they make an impression on us. Suspension of judgement gets its name from the fact that the intellect is suspended so as neither to posit nor to reject anything because of the equipollence of the matters being investigated.¹⁴⁷

Given the above anti-realist tendency, the Liar Paradox can be dissolved. Assume that there are two contradictory proposition p and $\text{not-}p$. The Liar sentence can be substituted for ' p ' like any other legitimate truth-bearer. The situation raised by the Liar Paradox is that the justification for knowing that p is *no more true* than its negation just insofar as the justification for knowing each one is equally good (or equally bad). This is the sense behind interpreting the *Ou Mallon* principle, the *Dissoi Lógoi* and the concept of suspension of judgment in epistemological terms. Consequently, an analysis of the Liar Paradox within an anti-realist outlook necessitates the use of epistemic notions. Anti-realism must thus supplement the use of classic logic with epistemic logic, since truth-value is always an epistemic issue that cannot stand on its own in any objective sense. It does not necessarily reject classical logic, but sees it as insufficient for a complete analysis, since epistemic parameters (or operators) are necessary for a full analysis. However, modern anti-realism tends to replace classical logic with some non-classical system, such as three-valued logic.

For the sake of the argument, assume that the justification n has for knowing that p (i.e., $K_n('p')$) is just as good as the justification for knowing that $\text{not-}p$ (i.e., $K_n(' \sim p')$)¹⁴⁸. Thus, the premise is:

(1)	The justification n has for knowing that p is equivalent to his justification for knowing that $\text{not-}p$: $\sim K_n('p') \equiv \sim K_n(' \sim p')$
This will constitute an epistemic reading of Democritus and Nausiphanes. However, it is still true that:	
(2)	It is logically impossible that both ' p ' and ' $\text{not-}p$ ' are true: $\sim \Diamond(p \wedge \sim p)$
The logical corollary of (2) according to epistemic logic is:	
(3)	n should know that the conjunction of p and $\text{not-}p$ is false: $K_n(' \sim (p \wedge \sim p)')$
The triad of propositions (1)-(3) is perfectly consistent logically as long as epistemic notions are not mixed with logical ones. Furthermore,	
(4)	If n knows that p and also knows some other proposition q , this provides a justification for knowing that p and q : $[K_n('p') \wedge K_n('q')] \supset K_n('p \wedge q')$
Thus, no one can know a false proposition.	
(5)	If it is impossible that p , then n does not know that p : $\sim \Diamond p \supset \sim K_n('p')$
If a given proposition is false, then there cannot be sufficient reason for knowing it. It can be false knowledge or a mistake, but not genuine knowledge. In any case, there cannot be any sufficient reason to know obvious impossibilities. To summarize (1)-(5), the conclusion regarding the contradiction generated by the Liar Paradox is that:	

- (6) If it is logically impossible that both ' p ' and 'not- p ' are true, then n cannot have any justification for knowing this impossibility: $\sim\Diamond(p \wedge \sim p) \supset \sim K_n('p \wedge \sim p')$

So far, there is no disagreement with realism, but at the same time, the Liar Paradox is still unresolved.

Even Protagoras could surely have accepted the above reasoning, especially (2) and (6), due to his reputation as a shrewd philosopher. Due to his epistemological relativism, however, he would derive a different conclusion from it. Protagoras can be fairly characterized as holding a version of extreme empiricism, according to which it is impossible to found genuinely objective judgments on subjective foundations. Accordingly, his relativist epistemology implies the following claim:

- (7) Although nobody can know overt impossibilities, it is possible that some proposition p may be known by one person n to be true while its negation is known by other person m to be true: $\sim\Diamond(p \wedge \sim p) \wedge [K_n('p') \wedge K_m(' \sim p ')]$

This situation is legitimate in epistemic notions as long as objective knowledge is rejected as unattainable. According to Protagoras, man is the measure of truth and there are no objective grounds for determining the realist truth-value of a given belief:

Thus according to him man becomes the criterion of the things that are; for everything that seems to men, actually is; and what seems to no man, is not. [80A14]

There is no objective truth but only an empiricist version of subjective relativism:

Sometimes when the same wind blows, one of us shivers and the other doesn't; or one of us mildly, the other violently. - Yes indeed - Then shall we say that the wind is in itself cold or not cold? [80B1, Plato, *Theaetetus* 152B]

In epistemic logic, this will amount to the rejection of the possibility that any proposition can be known to be true by everyone just because it is objectively true. That is, there cannot be a universal quantification over the knowing subjects.

- (8) It is never the case that everyone know some proposition to be true:
 $\sim\forall x\exists y K_x('y')$

Thus, according to subjective relativism, it is perfectly possible that two persons know two contradictory propositions to be true at the same time.

- (9) n knows p to be true while m knows it to be false: $K_n('p') \wedge K_m(' \sim p ')$

Line (9) can be taken further and quantified as follows:

- (10) There is a ' x ' and a ' y ' such that x knows ' p ' to be true while y knows it to be false: $\exists x\exists y(K_x('p') \wedge K_y(' \sim p '))$

An even further exclusion of subjective relativism would be to accept the possibility that the same person can know a proposition to be true at one time and to be false at another. Protagoras is known for his extreme empiricism regarding sense perceptions:

Everything that seems to men, actually is; and what seems to no man, is not. [80A14]

To this empiricist relativism he added a relativist theory of knowledge:		
Protagoras says that on every issue it is possible for it to be argued with equal force on both sides. [80A20]		
There is a scholarly controversy about radical his epistemology is in its subjectivity ¹⁴⁹ . However, if one understands his position as an extremely radical one, then a way of dissolving the Liar Paradox in line with the philosophy of Protagoras is clear:		
(11)	'x' in line (10) above is not necessarily identical to 'y': $\sim \delta(x \neq y) \equiv \Diamond(x=y)$.	
Conclusion: If the Liar Paradox is rephrased in epistemic terms, its conclusion is not a strict logical impossibility. It can be a legitimate possible epistemic situation, in which a person knows two contradictory propositions to be true at two different times. Namely:		
(12)	n knows p to be true at one time and knows it to be false at another time: $K_n('p') \wedge K_n(' \sim p')$	
However, to maintain line (11), line (4) must be rejected on epistemic considerations. This rejection will follow, in a general way, the rationale behind three-valued logic or intuitionistic logic, which is to be expected in view of their anti-realist and skeptic stance.		
Full-blown epistemological relativism, especially if it is as radical as the one Protagoras holds, does have its shortcomings. More moderate versions distinguish between two basic cases. In the first case, the truth-value of propositions can be determined, because intrinsic properties of object are involved (this kind of propositions involves an <i>eteéi</i> quality). In the second case, this cannot be done because non-intrinsic properties are involved (this kind of proposition involves <i>nomôî</i> qualities) ¹⁵⁰ . Thus, skepticism applies only to certain cases and does not necessarily discard knowledge as a whole. This can be rephrased as follows (starting again with premise (6) above):		
(7)	Either the conjunction of p and not- p is false (if p involves a <i>nomôî</i> quality), or else one cannot know which, if either, of p or not- p is true (if p involves an <i>eteéi</i> quality): $\sim \Diamond(p \wedge \sim p) \vee (\sim K_n('p') \vee \sim K_n(' \sim p'))$	
Now, the <i>Ou Mallon</i> principle is relevant to cases of undetermined rational beliefs, in which we have two propositions such that neither of them is reasonable to accept, nor can we accept one and reject the other. Assuming premise (1), above, then:		
(8)	Possibly both p and not- p : $\Diamond p \wedge \Diamond \sim p$	
Anti-realism recognizes cases in which it cannot be determined whether one is telling the truth. In other words, if one asserts that he is telling the truth, it does not necessarily follow that the asserted proposition is indeed true. Thus, the following epistemological situation is a legitimate one in anti-realist or skeptic terms:		
(9)	Even though n says that ' p ' and says that it is true, it does not necessarily follow that indeed n ¹⁵¹	n says that ' p ' n tells the truth

	follows that indeed <u>p</u> . ¹⁰¹	<p>-----</p> <p>~ δp</p>
<p>This situation is one of the points where realism and anti-realism diverge. The objective ground in realism disappears and the need to suspend judgement becomes a necessity. As Sextus Empiricus remarks:</p> <p style="padding-left: 40px;">The phrase... 'I do not apprehend' also shows the skeptic's own feeling, in virtue of which he refrains, for the moment, from positing or rejecting any of the unclear matters being investigated¹⁵².</p> <p>Therefore:</p>		
(10)	<p>If n says he knows that p, it is still possible that not-p: $K_n('p') \supset \Diamond \sim p$</p>	
<p>Conclusion: If this situation is legitimate, as it is in relativist epistemology, then the idea that there is a necessary logical relation between asserting a proposition and its truthfulness is rejected. The Liar Paradox can be generated only if there is an objective, necessary connection between saying that one knows 'p' and its truthfulness. However, from an anti-realist and skeptic stance, this connection is rejected and the paradox is thereby dissolved.</p>		

7. Conclusion: The Liar Paradox as a metaphysical issue

The use of the Liar Paradox by skeptics as a form of critical thinking has an important role in intellectual progress, as Popper notes in his paper, "What is dialectics?"

[Dialectics observes], correctly, that contradictions are of the greatest importance in the history of thought - precisely as important as is criticism. For criticism invariably consists in pointing out some contradiction... a contradiction within the theory criticized... Criticism can never do anything except either point out some such contradiction, or, perhaps, simply contradict the theory... But criticism is, in a very important sense, the main motive force of any intellectual development. Without contradictions, without criticism, there would be no rational motive for changing our theories: there would be no intellectual progress.¹⁵³

The 'critical method' is the special mark of Greek skepticism, as it is most concerned to refute theories as a means to acquire tranquillity. Skeptic philosophers use the Liar Paradox to elicit particular implications of the general theory of realism with the intention of showing its internal inconsistency. The use of the Liar Paradox is only one instance of the rational procedure embodied in the use of the *Reduction ad Absurdum*. Criticism and refutation form the very structure of Greek skepticism and the 'critical method' is the key to understanding the tensions between skepticism and dogmatism. Greek skepticism did not just reject a given philosophical view, as the mere act of contradicting a philosophical claim, but critically examined it and devised destructive arguments. The nature of the criticism is the crucial distinction between rejecting an argument for a conclusion and rejecting the conclusion itself, for which the *Double Arguments* is maybe the earliest example. The Liar Paradox plays a part in rejecting the realist position by critically examining its arguments. Placing the Liar Paradox in this broad context assigns it a more fundamental function in philosophy than a mere semantical difficulty or sophism. Thus, its nature and function must be derived from the place it has in the general critical discussion of the question of realism. The paradox thus becomes a part of a *Reduction ad Absurdum* argument in metaphysics and epistemology.

One of the prevailing ways of dismissing the Liar Paradox (as noted in section 5.3, above) is by calling it counter-intuitive - an argument that opposes the common intuitions regarding the use of the words 'true' and 'false'. However, this reaction misses the whole point, since the threat of the paradox is not for common sense

raise. However, this reaction misses the whole point, since the threat of the paradox is not for common sense but for metaphysics, just as Zeno's paradoxes of motion do not threaten the common sense of everyday life, but the metaphysics of ontological pluralism. The fact that common sense and perception contradict Eleatic metaphysics is no justification for rejecting it, since common sense is not a metaphysical theory, as realism or ontological pluralism are. It is told about Antisthenes that:

Antisthenes the Cynic, unable to answer [Zeno's arguments against motion] got up and walked, deeming a proof by action more potent than any logical confutation. [29A15] [154](#)

Obviously Antisthenes missed the whole point. The aim of the Eleatic school was to construct an argument in a metaphysical controversy about the true ontology of reality. Common sense was rejected as a metaphysical theory about reality and not as an instrument of practical life and action. Both Sextus Empiricus and Diogenes Laertius say that Parmenides

...makes it clear that one should not attend to the senses but to reason. [28A1. Diogenes Laertius IX.22]

Parmenides puts it this way:

You must debar your thought from this way of search [for the truth], nor let ordinary experience in its variety force you along this way, [namely, that of allowing] the eye, sightless as it is, and the ear, full of sound, and the tongue [namely, language], to rule; but [you must] judge by means of the reason [argument, *logô*] the much-contested refutation which is expounded by me. [28B7.3-6]

Parmenides warns against relying on the senses, which lead people along the path of deceptive opinions paved with falsity. Only reason and arguments can lead people along the narrow path of Truth (28B8) [155](#). Parmenides put the whole weight of proof and disproof on reason, since he sees his metaphysical claims as based on logical and rational inquiry. Parmenides' conclusions should not be rejected on the basis of sense perception. Rather, his reasoning must be countered by reasoning, namely, showing where his arguments fail. In contrast to Antisthenes' failure to understand Parmenides' logical point, the following example shows an attempt to face Parmenides' reasoning on the logical level.

Melissus of Samos is known for his poem *On Being*, in defense of Parmenides' theory (30A4). He introduces a *Reduction ad Absurdum* argument to support ontological monism and Eleatic metaphysics (30B8). Aristocles of Messene quotes this argument and then criticizes it (30A14). He raises an objection to skeptical arguments about the senses, which constitutes an important part of Melissus' *reductio*, as it was an important part of Parmenides' metaphysics. Aristocles' main criticism is that Melissus starts from the data of perceptions and ends by disregarding them, and thus, his argument is self-refuting. Aristocles has mistakenly assumed that Melissus believes in relying on the senses, whereas Melissus only presents this as a hypothesis which he eventually shows to be false [156](#). However, the important point here is that Aristocles was trying to refute Melissus' argument on logical grounds, thus meeting Parmenides' requirement. Furthermore, he clearly saw the true nature of the Eleatic arguments as metaphysical ones that have nothing to do with sense perceptions of everyday life. They constitute a logical and rational investigation, and so any criticism of them must be logical and rational as well.

The Liar Paradox is completely analogous in this respect to the metaphysical arguments of the Eleatics. The reasons that it was formulated and used in the skeptics' arguments are metaphysical and epistemological. There is nothing in the paradox that involves the normal use of natural language; its only concern is with the theoretical claims of the metaphysical doctrine of realism.

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Endnotes

¹Aristotle, *On Sophistical Refutations* 180b2-4; Cicero, *Academica* II.91-98. These are discussed below in section 4.4.

²Martin 1984, 1.

³Parsons 1984, 9.

⁴Martin 1978, 1984.

⁵Cicero argues that the Greek work for 'paradox' is a Stoic term for a kind of dilemmas, such as the Liar Paradox. See Cicero, *Academica* II.136.

⁶The prevailing opinion today, which sees Zeno's paradoxes as mathematical problems concerning the issue of continuity. Understood in this way, it is not surprising that the prevailing opinion is that the appropriate solutions must be mathematical. William McLaughlin, for instance, believes that the development of new mathematical tools will provide definitive solution for Zeno's paradoxes (see McLaughlin 1994 and McLaughlin and Miller 1992). This mathematical solution, however, like many similar ones, has no bearing on the fundamental metaphysical problem that underlies these paradoxes. For the metaphysical nature of Zeno's paradoxes and their philosophical role in the controversy about Parmenides' ontological monism, see Barnes 1982, chapters XII-XIII. For a rather surprising conclusion regarding Zeno's philosophical goal in the formulation of his paradoxes, see pp. 234-235.

⁷An interesting historical fact is that the founders of Stoicism were disciples of the Megarian School. They took, however, only the more positive parts of Megarian philosophy, especially the Megarian logic of propositions. For a description of the main figures and schools in early Hellenistic philosophy see Sedley, 1980. For a biographies of the main figures in Classical and Hellenistic philosophy and the interconnections between them, see Bochenski 1961, 105-107; Mates 1953, 5ff; and Sedley 1980, 17-18.

⁸Cf. Prior 1965, 224-225.

⁹*Bibliographic note:* If it is not mentioned otherwise, all the translations of the original Greek texts are those of *The Loeb Classical Library*. An excellent bibliographical source for Greek and Roman texts is the *Perseus Project* (Crane, February 1999). For the English translation of the Presocratic fragments, see Freeman 1978. Kathleen Freeman gives a complete translation of the B-sections in Hermann Diels and Walther Kranz 1954. For a computer text file containing most of the Presocratic fragments and testimonials, see Fieser, February 1999

¹⁰Paul, *Epistle to Titus* I.12-13.

¹¹See Anderson 1978. Alan Anderson does not give any references, but see, for instance, Polybius of Megalopolis, *The Histories* XXVII.14 and Strabo of Amaseia, *Geography* X.4.9.

¹²For the seemingly paradoxicality of the Epimenides paradox see Prior 1968 and Mates 1981, 17. For Epimenides' peculiar life story, see Dobbs 1951, 141ff. See also Mates 1981, 164, note 11.

¹³One of the dangerous faults in the philosophical interpretation of the Greek period is its idealization. Moreover, there is excessive concentration on the intellectual male elite of that period, ignoring Greece's complex Mediterranean culture. For a comprehensive picture of the Greeks, see Dobbs 1951.

¹⁴Euthydemus 283E-284C.

¹⁵For the relevant section that discusses problems similar to the Liar Paradox, see Euthydemus 283E-286E. Concerning the dating of Euthydemus, see Taylor 1960, 90-91. The discussion held by Euthydemus and his brother Dionysodorus appears in the *Cratylus*.

¹⁶Aristotle, *On Sophistical Refutations* 180b2-4.

¹⁷Athenaeus Naucratica, *Deipnosophists* IX.401E. This literary anecdote is mention by Alfred Tarski as a serious indication of the importance of the Liar Paradox. See Tarski 1969, p. 66.

¹⁸Diogenes Laertius, II.108. Besides the Liar Paradox, Eubulides formulated other known paradoxes, such as the sorites paradox, which is also called the Heap, the Hooded Man and the Bald Man. For a modern survey of the sorites paradox, see Hyde 1998. Cicero, however, says that the paradox was first "discovered" a century later, by Chrysippus of Soli, who lived in the second century. I prefer Diogenes' version, since the formulation of the paradox by Eubulides accords with other testimonies, such as that of Sextus Empiricus, as well as other evidence discussed below.

¹⁹Diogenes Laertius V.49.

²⁰Diogenes Laertius VII.196-197.

²¹Cicero, *Academica* II.91-98.

²²Bochenski lists seven different versions of the Liar Paradox (Bochenski 1961: 131-132). The versions are taken from Roman sources and are mostly commentaries on Aristotle's work.

²³For the meaning of the concept of assumption or 'lemma' in Stoic logic see Diogenes Laertius, VII.45, 77; Sextus Empiricus, *Outlines of Pyrrhonism* II.135ff, 172ff.

²⁴For the process of formulating a chain of well-formed arguments in logic, see Sextus Empiricus, *Against the Logicians* II.223, 229, 231, 235, 240.

²⁵See Barnes 1980 for a discussion on Greek skeptics' approach to deductive logic.

²⁶Groarke 1990. For an historical survey of Greek skepticism and the main surviving evidence, see Stough 1969. For a description of the main figures in Hellenistic philosophy, see Sedley 1980.

²⁷Groarke 1990, 19-20. See also chapter VII, esp. pp. 150ff.

²⁸For details about the skeptical Academy see Dillon 1973, Tarrant 1985 and Groarke 1990, 66, 98ff. For a detailed description of the various strategies used in Greek skepticism, see Striker 1980. It is important to note that Striker does not mention the role of paradoxes in Greek skepticism. Still, his paper is one of the best surveys of their argumentative strategy. This shortcoming is typical of the scholarly study of Greek philosophy.

²⁹The relevant passage for the following discussion is *Academica* II.91-98.

³⁰For the skepticism of Carneades of Cyrene, see Groarke 1990, chapter V and Stough 1969, chapter 3. For the role of Carneades, Philo of Larissa and Antiochus of Ashkelon in the Hellenistic philosophy see, Long 1974, 222-229 and Sedley 1980.

³¹For a discussion of this important fact, see Stough 1969, chapter 3.

³²On the two figures responsible for leading the Academy to thorough skepticism see, Diogenes Laertius IV.28-45, 62-66, respectively. According to Diogenes Laertius, IV.62, Carneades said, ironically, that he owned his fame to the Stoic philosopher Chrysippus. Cf. Stough 1969, 35ff, and Groarke 1990, 98.

³³For the differences between the topics discussed by modern anti-realism and those in Greek philosophy in this context, see Groarke 1990, chapter 7.

³⁴For an introduction to the controversy between realism and anti-realist skepticism in Greek philosophy and skeptical criticism of the pretension to realist truth and certainty, see Annas 1980. See there especially pp. 101-103 for the unique realist meaning of the concept of truth in Greek philosophy. See also the papers in the anthology of Huby and Neal (1989) that survey the history of the concept of truth in Greek philosophy. The papers relevant to the discussion here are Chapters 1 to 9. For a further discussion on the commentators' claim about the philosophical meaning of truth in Greek philosophy, see Burnyeat 1982, especially p. 38, 48; Denyer 1991, especially chapters 1-2; Friede 1984, especially p. 187; Groarke 1990, 19-20, 58-60; Stough 1984, especially p. 161. These works contains many references to Greek texts that support the above claim about the realist essence of truth in Greek philosophy. See also Campbell 1992, chapter 1, which surveys the history of the concept of truth in Greek philosophy. Campbell argues that in the Greek view of truth is a temporal, unchanging and free from any relativist or subjective limitations. The conceptual crisis about truth, he argues, begin only in the seventeenth century.

³⁵Aristotle, *Metaphysics* 1011b26-30. This realist definition of truth can be found in many other places. See, for instance, Aristotle, *On Interpretation* 18a40-b3. For a typical interpretation of the above passage see Kirwan1971, 117. For a discussion of the nature of Aristotle's concept of truth and the issue of whether he offers a definition or only a criterion of truth, see Hamlyn 1989.

³⁶Aristotle, *Metaphysics* 1025b25ff; *On Interpretation* 16a9-14.

³⁷Here Aristotle raises the dilemma that Plato discusses in the *Sophistes*, and like him he looks for the appropriate entity for the relation of correspondence with objective reality. For the sequence of correlations between speech as a symbol and thought as a symbol with state of affairs, see Aristotle, *On Interpretation* 16a2-10. On the issue of the correlation between linguistic expressions and extra-linguistic objects, Aristotle distinguishes between equivocal, univocal and derivative relations. See Aristotle, *Categories* 1a11ff, *On Sophistical Refutations* 177a9ff, cf. 16b30ff.

³⁸In this way Aristotle captures the modern concept of the proposition. See *On Interpretation* 17a8f. Cf. Plato, *Cratylus* 384d.

³⁹Aristotle, *On Interpretation* 17a2ff.

⁴⁰Aristotle's theory of truth resembles Frege's semantics, but still it uses metaphysical and ontological terms instead of the modern semantical ones. For this resemblance see, for instance, *Metaphysics* 996b26-30.

⁴¹On Interpretation 16a13.

⁴²Patrick Byrne (1997) offers a new study of the *Analytics* with an interpretation of Aristotle's concept of analysis. He concentrates on the semantic and logical aspects of this concept. He then explores the relationship between analysis and science in Aristotle's thought.

⁴³On Interpretation 19a33-34.

⁴⁴On the Soul 430b26. Aristotle's commitment to this concept of truth is manifest in his analysis of the concepts of thinking and perception. See *On the Soul* 429b24-431b19.

⁴⁵The Categories 1b25-2a4.

⁴⁶Sextus Empiricus, *Against the Logicians* II.100. It is interesting to note the great similarity between the discussion given by Sextus Empiricus and John Austin's discussion of the correspondence principle. For instance, Sextus Empiricus argues that the sentence "This man is sitting" expresses a true proposition if and only if the thing predicated, such as 'sitting', belongs to the object indicated.

⁴⁷As mentioned above, this realist meaning of the concept of truth is not unique to Aristotle. It is the meaning that was assigned to it in Greek philosophy. Plato is a further paradigmatic example of the adoption of the realist concept of truth. See, for instance, the definition given in the *Cratylus*, 393b-385c. This definition is a starting point of the discussion with Hermogenes on the linguistic, epistemological and metaphysical nature of proper names. In the *Euthydemus*, the realist definition of the concept of truth is used as a starting point for the discussion about the possibility of asserting false propositions. Euthydemus assumes offhand the realist meaning of truth and the sharp distinction between truth and falsehood, i.e., the bivalence principle (*Euthydemus* 283E-284C). See also Nicholas Dancy's *Language, Thought and Falsehood in Ancient Greek Philosophy*. The issues in this discussion are not considered universal, but refer explicitly to the specific meaning of realist truth and presuppose it. These issues were already discussed by Protagoras (*Euthydemus* 286C), and also appear in the *Republic*. The solution there is a sharp distinction between knowledge (*epistēmē* or *prolēpē*) and belief or opinion (*doxa*), *Republic* 476D-478E, and the need to assume a third state of ignorance (*agnōia*), *Republic* 477A, 477E. There is, in some sense, an earlier repetition of this distinction in the *Gorgias*, 454D-454E; but here the distinction is bipolar between knowledge and belief. For the graduate change from knowledge or absolute truth to ignorance of falsehood, see *Republic* 478B-C, 478C-D, 478D-E. These moves are carried out by Plato to maintain the realist concept of truth in spite of the seeming paradox of Euthydemus. In general, the Platonic theory of truth is formalized in two of the late dialogues, *Theaetetus* and *Sophistes*. The main point is that truth and falsehood are attributes of judgments: Knowledge is a true judgment (*alēthēs doxa*). See Theaetetus' second attempt to define knowledge in the *Theaetetus* 187B. However, Plato does not mean that truth is the attribute of mental knowledge (*pathēmata*), since he identifies judgment with speech (*lēgēin*) in the *Theaetetus* 189E-190A. The idea that truth and falsehood are primarily attributes of a proposition or speech (*logos*) is central to the *Sophistes* (263B). Propositions expressed in language by sentences are only the tools for representing pure epistemological entities, such as thoughts (*noēmata*) or judgments (*Sophistes* 263D). Plato uses there this idea for solving the problem raised by Euthydemus, i.e., how falsehood is possible.

⁴⁸There are some crucial issues discussed by Aristotle concerning the logical principles, which are unsettled in Aristotle's philosophy, for instance, his undertaking to define their exact nature, and the problem of their philosophical justification, e.g., his suggestion for justifying the principle of contradiction with a refutation argument. For more on these subjects see Barnes 1969; Dancy 1975, especially chapter 1; Lear 1980, chapter 6; Lukasiewicz 1971.

⁴⁹The following formulations to the principle of contradiction are only examples. For additional formulations see, e.g., *On Interpretation* 17b20-23; *Prior Analytics* 51b36-40, 63b41-64a4; *Posterior Analytics* 77a10-18; *Topica* 113a25ff. Cf. Bochenski 1961, 60-63; Kneale 1962, 46-47.

⁵⁰*Metaphysics* 1005b18-34.

⁵¹*Metaphysics* 1011b14-18.

⁵²*Metaphysics* 998b29-30. This can also be seen as an alternative formulation of the principle of the excluded middle.

⁵³The following are two alternative formulations of the principle of excluded middle. Aristotle devotes the fourth chapter of the *Metaphysics* to the justification of this principle. In the ninth chapter of *On Interpretation*, he discusses the validity of the principle for future contingent events. For further formulation of the principle see *On Interpretation* 18a28-31; *Prior Analytics* 51b36-40.

⁵⁴*Metaphysics* 1011b23-24.

⁵⁵*Metaphysics* 1012a10-15. This formulation can be seen as alternative version of the principle of bivalence.

⁵⁶On Interpretation 17a3-4. The last formulation of the principle of bivalence explicitly refers to the principle of the excluded middle. These two principles are entangled with each other, though the one does not necessarily imply the other, as shown by modern intuitionistic logic.

⁵⁷*Metaphysics* 1011b25-26.

⁵⁸The skeptics of the classical and Hellenistic periods already saw the Presocratic philosophers as the forerunners of late Greek skepticism. For a detailed survey of early skepticism in Presocratic philosophy, see Groarke 1990, chapter 2.

⁵⁹Diogenes Laertius IX.72. This assertion is part of a major argument raised by Democritus concerning the limitations of the senses in knowing reality. It is part of his atomistic physics, as this skepticism was aimed at the empiricist criterion of knowing the truth. Democritus still held that the "true" (in its realist meaning) construction of reality can be known through a sort of rationalist method; it only cannot be known by the empiricist criterion.

⁶⁰Sextus Empiricus, *Against the Logicians* I.49 (110).

⁶¹Plutarch, *Table-Talk* IX.7 (746B). See also Barnes' analysis of these two fragments (Barnes 1982: 136-143).

⁶²This kind of problems are extensively discussed in the secondary literature. As for the above, see, for instance, *On Interpretation* sec. IX, 18a28ff. Cf. Lukasiewicz's discussion of the difference between the principles of the excluded middle and bivalence in Aristotle, and the problems they involve (Lukasiewicz 1971, 1972: 82). See also *On Interpretation* 17a33-38, 19a27-36 and *On Interpretation* 19a39-19b4. For additional examples see, e.g., *On Interpretation* 17b30. This discussion is naturally connected to the issue of fatalism, which was known in the ancient world as the *Idler* argument (*argos logos*). For Cicero's discussion of this argument and Chrysippus' criticism, see Cicero, *On Fate* 28-30. For his confidence in the certainty of logical principles, see *Metaphysics* 1005b11-1011b22. Cf. Lear 1980, chapter 6.

⁶³For the argument see Plato, *Euthydemus* 283E-284C. Afterwards, Euthydemus' brother, Dionisodorus, begins with Euthydemus' conclusion, that a false proposition is impossible, and argues that it is impossible to contradict a given proposition. For a discussion of this passage in particular and the general question regarding the possibility of false propositions, see Denyer 1991, 15-18. Sprague argues that Euthydemus is an historical figure of the time of Socrates (Sprague 1972: 294-295). Hermann Diels, however, did not think so, and thus did not include him in his *Die Fragmente der Vorsokratiker*. For the important citations from the *Euthydemus* which can be ascribed to the historical Euthydemus, see Sprague 1972: 295-301.

⁶⁴The attribution of the paradoxical proposition to Prodicus and the hints of the argument in support of this proposition are given in a papyrus revealed in Cairo in 1941. For the relevant passage and a discussion of this papyrus see Denyer 1991, 25-27, Kerferd 1981, 89-90. The fragment is not included in Diels-Kranz. For the other fragments of Prodicus and a biographic survey, see Sprague 1972, 70-85.

⁶⁵Aristotle, *Topica* 104a20-21. See also Diogenes Laertius, VI.1-19. For a discussion of Antisthenes' philosophy, see Denyer 1991, 27-33, 36-37, Dudley 1967, 1-16. The prevailing conjecture is that Antisthenes is the one of the main targets of the dialogues that discuss Plato's position on issues such as proper names, propositions, truth, falsehood and contradiction. This conjecture, if true, shows the philosophical importance of his assertions on these philosophical issues. However, see the reservation raised by Taylor 1960, 86, note 1.

⁶⁶The above descriptions of the theory of truth held by Antisthenes, and the way he derives his conclusion, are based on Aristotle's discussion of the subject in the *Metaphysics* 1024b29-1025a1.

⁶⁷Diogenes Laertius VI.3

⁶⁸For this issue, see Denyer's introduction to Aristotle's approach (Denyer 1991: chapter 10).

⁶⁹This is a 'reasonable' assumption in the sense that there is no contradictory evidence, while there is some circumstantial evidence for its correctness. It is known, for instance, that there was a heated controversy on logical and philosophical issues in general between Euclides of Megara and Eubulides of Miletos on the one hand and Aristotle on the other. The fact that Aristotle refers to the Liar Paradox as part of his general discussion in sophistical arguments is important. This places the Liar Paradox within the typical philosophizing of the Megarians and of Eubulides in particular.

⁷⁰This version is based on Aristotle, *On Sophistical Refutations* 180b2-4. For a more elaborate version see below. The alterations in the above version are based on the Aristotelian commentator Alexander of Aphrodisias, *Commentarium in Aristotelis Sophisticos Elenchos*, 165b (171.18f).

⁷¹This is not a trivial conclusion, since it is rejected by paraconsistent logic, which considers a contradiction a legitimate proposition and argues that logic should acknowledge the existence of paradoxes and assimilate them as a legitimate part of logical reasoning. For a survey of the subject and a comprehensive collection of papers on it, see Priest, Routley and Norman 1989. Graham Priest is a known advocate of paraconsistent logic. See, e.g., Priest 1979, 1984.

⁷²There are at least seven paradoxes attributed to Eubulides, including the Liar Paradox. See Diogenes Laertius, II.108. On the Liar Paradox see Cicero, *De Divinatione* II.11, *Academica* II.96. Cf. Bochenski 1961, 105ff, 131; Kneale 1962, 113-114; Rist 1969, 146; Watson 1966, p. 67.

⁷³Not much is known about the Megarian School and its prominent figures. Most of the evidence is taken from Diogenes Laertius, which sums up most of what is known today about the school. See Diogenes Laertius, II.106-109, 111-114, VII.1-2, 16, 25, 168, 179-180. There is some additional important evidence in the writings of Sextus Empiricus, which will be cited below.

⁷⁴The model for dialectical investigation available to Plato and Aristotle was Zeno of Elea and his use of *Reductio* arguments. Zeno was considered by Aristotle and others as the inventor of dialectics (Diogenes Laertius, VII.57, IX.25; Sextus Empiricus, *Against the Logicians* I.7). For a discussion of dialectics in Plato's dialogues and the Socratic questioning (*elénchos*), see Robinson 1962, chapter 10.

⁷⁵For instance, Diodorus Cronus, one of the prominent members of the school, was known by the epithet "the dialectician". See Sextus Empiricus, *Against the Professors* I.310.

⁷⁶For the claim that *Reductio* arguments are the most basic meaning of 'dialectics', see Plato, *Phaedo* 101D.

⁷⁷Diogenes Laertius, II.106-108.

⁷⁸Diogenes Laertius, II.109, IV.36.

⁷⁹For the connections between the Megarian and the Eleatic schools, see Diogenes Laertius, II.106-107; Cicero, *Academica* II.129. For a discussion of this philosophical influence, and for more evidence, see Groarke 1990, 70-71.

⁸⁰Kneale notes dialectics was used in metaphysical arguments in fourth-century Greek philosophy (Kneale 1962, 7).

⁸¹*Prior Analytics* 24a23-26. For one of the discussions given by Aristotle on the issue of dialectics, which is relevant to the above discussion, see *Topica* 104a2-105a34. For an analysis of the issue from a logical point of view, see also Lear 1980, chapter 3.

⁸²The early dialogues are the most important in the above respect, since they end in inconclusiveness (*aporia*). The dramatic effect and the philosophical point are due, on the one hand, to Socrates' success in refuting his opponents' assertions, and, on the other, to the lack of a positive answer to the problem discussed in the dialogue. This point is elaborated by Alexander Koyre (1960: book 1).

⁸³*Prior Analytics* 41a.23-34. Aristotle mentions this in several other places. See, e.g., *Prior Analytics* 40b25, 45b15, 50a32.


⁸⁴*Prior Analytics* 50a35-6.

⁸⁵This special form of arguments is probably the reason for the great interest of the Megarian school and consequently of Stoicism in the issues of hypothetical propositions and the correct semantic definition of implication. For more on this see Sextus Empiricus, *Outlines of Pyrrhonism* II.110-112.

⁸⁶Aristotle, *Prior Analytics* 41a31-3.

⁸⁷There is occasional confusion about the difference between *Reduction ad Absurdum* and *Reduction ad Impossible*. *Reductio ad Impossible* involves the entailment of a contradiction, while the *Reduction ad Absurdum* involves the entailment of merely an obvious falsehood, but not a

contradiction. The early Socratic dialogues are an example of the type of *Absurdum*, since they

involve the entailment of falsehood in most cases. Indirect mathematical proofs are examples of *Impossible*. The first source for the use of *Reductio ad Impossible* is probably the Pythagorean mathematicians. The Pythagorean philosophers used this form in discovering the geometrical expression of the irrational number . Aristotle classifies the proof of this theorem as a typical example of a *Reductio ad Impossible* that is based on the logical and philosophical entailment of a self-contradictory

conclusion. For the details of this example, see *Prior Analytics* 41a21-41b4. Plato, however, was apparently unaware of the difference between these two sorts of *Reductio*. In the *Phaedo*, where he discusses hypothetical argumentation, he says that every refutation of a hypothesis is based on the derivation of contradictory conclusions (*Phaedo* 101D). On the other hand, not every argument in the dialogue is of the *Reductio ad Impossible* form. One possibility is to see *Reduction ad Absurdum* as the more general form, and *Reductio ad Impossible* as an instance of it.

⁸⁸Aristotle, *On Sophistical Refutations* 174b13-20. For the citation see there 174b16. For the nature of paradoxes, see also the *Art of Rhetoric* 1399a22-25.

⁸⁹There have been many studies of the logic used by the Megarian School and their followers in the Stoic

school. For the more basic ones, see Bochenski 1961, 109-130, Graeser 1978, Kneale 1962, 113-176, Mates 1953, Mueller 1978. See there for the substantial differences between Aristotelian logic and the Megarian and Stoic schools. See especially the discussion about the subtle difference between a sound argument and an argument that is merely valid. Part of the interpretation proposed here is based on the various details of this logic.

90This conjecture is shared by three of the authorities on the history of the logic of the Megarian and the Stoic schools. See Bochenski 1961, 105-109, Kneale 1962, 113-117 and Mates 1953, 5-8.

91*Prior Analytics* 53b12-57B18. This passage is enigmatic since it does not fit into the sequence of subjects in the text, nor is its relation to Aristotelian logic clear. Cf. Kneale 1962, 97.

92See the passage *Prior Analytics* 57a36-57b17. The above schema is based on the example discussed by Aristotle in that passage. Cf. Kneale 1962, 96ff.

93For the formulation of the rule of contraposition, see *Prior Analytics* 53b12.

94For the formulation of the rule of transitivity, see *Prior Analytics* 57b6.

96It is known that Eubulides criticized much of Aristotle's philosophy and raised many detailed objections to it. However, not much is known about the details of the controversy. The main testimony to this is Diogenes Laertius, II.109.

97This is important for understanding the position of logic in Greek philosophy. For Plato, for instance, logical and mathematical investigations were used for the sake of discovering moral and metaphysical truths. This fact is manifest in many places. For instance, in *Euthydemus* 290A-E and *Republic* bk. VII, Plato talks about the education of the ideal ruler. Logic was not an independent subject even for Aristotle and the Peripatetic school. It was always understood as an ability or capacity (*dúnamis*) that can be taught just like any other skill or craft (*techné*) and thus should be part of general philosophical inquiry and teaching.

98Cf. Aristotle, *Topica* 159a18-25. Aristotle points out there that generating a paradox is the final goal of dialectical inquiry. See also *On Sophistical Refutations* 172b9-173a30, where Aristotle discusses at some length how to generate a paradox in a dialectical inquiry and notes that this is the goal of the sophist is philosophizing.

99Mates names this logic and the "Megarian-Stoic logic". For the logical terms used above see Mates 1953, chapter 5.

100Sextus Empiricus, *Outlines of Pyrrhonism* II.136. See also *Against the Logicians* II.367.

101Sextus Empiricus, *Against the Logicians* II.115ff. See also *Outlines of Pyrrhonism* II.110ff.

102Sextus Empiricus *Outlines of Pyrrhonism* II.137; *Against the Logicians* II.415.

103The definition of validity is attributed to Diodorus Cronus (Diogenes Laertius, VII.77).

104Diogenes Laertius, VII.79; Sextus Empiricus, *Outlines of Pyrrhonism* II.138.

105Sextus Empiricus, *Outlines of Pyrrhonism* II.157ff, *Against the Logicians* II.223, 228; Diogenes Laertius, VII.79ff.

106Sextus Empiricus, *Outlines of Pyrrhonism* II.156ff.

107Cicero, *Topica* 57.

108Sextus Empiricus *Outlines of Pyrrhonism* II.157; *Against the Logicians* II.225 and 227; Diogenes Laertius, VII.80. It is reasonable to assume that the source of this schema was the Megarian School, since it is fundamental to the dialectics of refutation used by Zeno of Elea.

109Sextus Empiricus *Outlines of Pyrrhonism* II.158; *Against the Logicians* II.226; Diogenes Laertius, VII.80.

110Sextus Empiricus, *Against the Logicians* II.229, 230, 231, 235, 237, 240; Diogenes Laertius, VII.77.

111Sextus Empiricus, *Against the Logicians* II.292; *Outlines of Pyrrhonism* II.242, 243. The above schema is a slight alteration of Sextus' exposition. Cf. *Against the Logicians* II.281. See also *Against the Logicians*

II.466 and *Outlines of Pyrrhonism* II.186. The reasonable assumption is that this inference-schema or theorem is part of the Eleatic dialectical heritage that was transferred to the Stoics by their Megarian teachers. Cf. Mates 1953, 80ff.

112Sextus Empiricus, *Against the Logicians* II.231.

113Sextus Empiricus shows in detail how this is done. He also gives examples of how to analyze an argument into its basic components.

114Diogenes Laertius, VII.79. Sextus Empiricus *Outlines of Pyrrhonism* II.187.

115Diogenes Laertius, VII.45.

116Menedemus is considered one of the members of the Megarian School. See Cicero, *Academica* II.129; Diogenes Laertius II.125-144. See also Denyer 1991, 37-43. The important point for the above discussion is that the Eretrian school, which was founded by Menedemus after he left the Megarian School, was based on the dialectics of the Megarians.

117Plutarch, *On Compliancy* 536B.

118Diogenes Laertius II.135.

119It is not difficult to see the resemblance between the theory discussed by Menedemus and Frege's approach. It is most striking with regard to the primacy of the relation between names and facts, which is similar to the function of proper names. See, e.g., Frege, 1892, 63. There are some similar modern examples of a theory of truth based on a rigid proposition-fact relation, akin to the name-object relation. See, e.g., the approach of Frank Ramsey (1965: 73-74 and 139-140).

120There is a disagreement among scholars, as to whether Menedemus held this theory of truth or whether it was only a part of his philosophical criticism of such theories, which were discussed at the time by the Megarian School. From the testimonies of Diogenes Laertius and others, it appears *prima facie* that this theory was held by Menedemus himself. Diogenes Laertius and the others are, however, ambiguous on this question. Denyer believes that this was a philosophical theory held by Menedemus (Denyer 1991: 37-43). Denyer does not, however, give any reasons for this and does not comment on the question of how this can conform with other contrary evidence about Menedemus. I suggest that the correct understanding of the above theory is that it is part of Menedemus' discussion of the paradox and provides the background for its formulation. The theory underlies the *Reductio ad Absurdum* aiming at disproving or refuting this theory of meaning. This interpretation conforms to several items of evidence about Menedemus as a philosopher, and I will mention only a few of them. First, Menedemus was known to have propound riddles and raised philosophical difficulties. Second, it is known that he taught philosophy, and that he was influenced by the dialectics of the Megarian School. Therefore, it is more reasonable that the theory of truth he presented was part of his teaching dialectics rather than a dogmatic teaching. Third, some of his philosophical riddles, cited by Diogenes Laertius, mock this particular theory, and it is thus unreasonable to assume that it was a theory he believed in. Finally, Diogenes Laertius cites Antigonos of Karistos, who says that Menedemus never held any philosophical theory. These considerations and others indicate that Menedemus introduced the theory for the purpose of refuting it eventually with, *inter alia*, the aid of his paradox. The paradox is therefore part of the criticism which characterized Menedemus' style of philosophizing rather than part of a serious dogmatic teaching.

121It is known that Megarian School had an important role in forming Greek skepticism as it was a major influence for the adoption of the dialectical method and the centrality of refutation in late Greek skepticism. It is prominent regarding the education of the skeptical philosophers. Most of the Pyrrhonist and Academic philosophers were taught by prominent figures in the Megarian School or their pupils. There are testimonies regarding these connections. They also attest to the general influence of the Megarian School on Greek skepticism, as well as the place of dialectics in Greek skepticism. See Diogenes Laertius IV.32, IX.61, and 64; Cicero, *Academica* II.97; Sextus Empiricus, *Outlines of Pyrrhonism* I.234, II.94; Suidas, "Pyrrho," II.278, "Socrates," IV.404. See also Groarke 1990, especially 70-71, 86-89 and 101. Groarke discusses the various problems about the exact historical connections between the Megarian philosophers and the many founders of Greek skepticism. From these testimonies and many others it is clear that there was a strong connection

between the Megarian school and late Greek skepticism.

[122](#)Aristotle, *On Sophistical Refutations* 180a23-180b.

[123](#)*On Sophistical Refutations* 166b21-27. Aristotle enumerates seven types of violation of inference rules that lead to fallacies. The Liar Paradox is classified within the second fallacy. For a summary of the discussion of fallacies that occur in practical arguments and a list of the various sorts of violation of inference rules in these fallacies, see Bochenski 1961, 54-55.

[124](#)For examples of this kind of fallacy, see *On Sophistical Refutations* 166b38-167a20.

[125](#)*On Sophistical Refutations* 180a32-180b2.

[126](#)*On Sophistical Refutations* 180b2-7.

[127](#)The 'idler argument' (*argós lógos*) is discussed in length by Aristotle in the ninth chapter of *On Interpretation*. It begins with the assumption that every affirmation or negation of a proposition is either true or false (18a28ff). The argument continues with a realist specification of the concept of truth, which is based on a strict relation of correspondence (18b37 and 19a33). These two premises lead to the problem of fatalism and free will. Aristotle proposes a modal theory as a solution. The Megarian School raised several serious criticisms against this modal theory, some of which are noted by Aristotle, *Metaphysics* 1046b29ff. Afterward, one of the remarkable dialecticians of the Megarian School improved the criticism in light of Aristotle's replies. See Plutarch, *On Stoic Self Contradictions* 1055D; Cicero, *On Fate* 13, 17 and 28-30. For a presentation of the fundamental philosophical problem raised by the idler argument, see Taylor 1957. For a discussion on the Aristotelian example of the naval battle, see Taylor 1957, 1, note 2. For a discussion on the Idler argument in Greek philosophy, see Mates 1953, 38-41; Rist 1969, chapter 7. An interesting point in Diodorus Cronus' criticism is the argument known 'the master', since it was supposed to be irrefutable. See Epictetus, *Discourses* II.19.1-5. The argument assumes three basic premises, which are implied by the Aristotelian realism and deal with the concepts of truth and necessity. However, it turns out that these premises are incompatible (*máchomai*). They thus constitute a *Reductio ad Absurdum* argument against the Aristotelian approach. The argument was constructed as such according to the Megarian tradition, as discussed above. For the logical and modal analysis of the master argument see Mates 1953, 38-40.

[128](#)This fragment describes the way Chrysippus understood the Liar Paradox and his thoughts about how to solve it. See Von Arnim 1964, II.298 a (106f). Not much is known about this fragment beyond its content. For its translation and a discussion on the content of this interesting fragment, see Bochenski 1961, 133.

[129](#)There are many studies on Stoic epistemology, its theory of truth and its propositional logic. See, for instance, Graeser 1978, 128-158, Mates 1953, chapter II, Mueller 1978, Watson 1966. For a detailed discussion of the nature of the criterion of truth in Stoic epistemology, see Rist 1969, chapter 8. For the similarity between the semantics developed by Stoicism and the theories of Frege and Carnap, see Mates 1953, 19-26. See p. 16 for a graphic scheme that emphasizes Stoicism's underlying realist outlook.

[130](#)Cf. Diogenes Laertius VII.63; Sextus Empiricus, *Against the Logicians* II.11, 38.

[131](#)Kripke 1975, Van Fraassen 1968, 1969.

[132](#)Cicero, *Academica* II.95.

[133](#)For a discussion on the irrelevancy of such a reaction to the problems raised by philosophical skepticism, see Stroud 1979, 279ff.

[135](#)*Academica* II.147.

[136](#)Sextus Empiricus stresses this point in several places. See for instance the *Outlines of Pyrrhonism* II.244-246.

[137](#)The new versions of the ordinary Liar Paradox are commonly classified as "strengthened liar". These strengthened versions were formulated as a response to the attempts made to solve the more ordinary versions. Robert Martin gives a short exposition to this evolution of the Liar Paradox in the "Introduction" to his anthology (Martin 1984). For further discussion on this complex evolution see also Barwise and Etchemendy 1987.

138 Greek skepticism distinguished between arguments that are external to realism, which are the constructive ones, and internal arguments, which are of the *Reductio ad Absurdum* form. On the one hand, there are Eanesidemus' Ten Modes against absolute proposition. These modes are an epistemological criticism constructed from a point of view external to realism and are empirical in their nature. On the other hand, there are Agrippa's Five Modes, which are considered complementary to those of Eanesidemus. These modes focus on conceptual and abstract issues from point of view internal to realism. They are *a priori* and logical, and some of them are formulated as refutation arguments, having the *Reductio ad Absurdum* form. Concerning Eanesidemus, see Diogenes Laertius, IX.78ff; Sextus Empiricus, *Against the Logicians* II.345. ff; *Outlines of Pyrrhonism* I36. ff. Concerning Agrippa, see Diogenes Laertius, IX.88-89; Sextus Empiricus, *Outlines of Pyrrhonism* I.167-177.

139 One of the points made by Plato in the *Parmenides* is to show that Zeno's dialectics is at least as damaging to the Eleatic doctrine as to the doctrine of ontological pluralism and movement. For an examination of the *Parmenides* see Solmsen 1971, Vlastos 1975, Von Fritz 1974.

140 The *Ou Mallon* principle is known also as the principle of *Isonomia*. For the formulation of the principle of *Ou Mallon* by Democritus, see fragment 68A114. There are additional testimonies regarding the nature of the skeptic formula of 'one proposition is no more true than another' and the philosophical discussion is generated. See also Cicero, *Academica* 2.43; Eusebius, *Preparatio evangelica* 738a; Hippolytus, *Refutatio Omnium Haeresium* I.23-3; Plutarch, *Reply to Colotes* 1108F, 1109A; Sextus Empiricus, *Against the Logicians* I.389. On the adoption of the *Ou Mallon* principle by various trends in Greek skepticism see also Eusebius, *Preparatio evangelica* 726d; Plutarch, *Reply to Colotes* 1124A; Sextus Empiricus, *Against the Logicians* I.232. For a discussion of the principle, see Barnes 1982, 553ff, DeLacy 1958, 1971, Groarke 1990, 52ff and 59ff.

141 Aristotle, *Metaphysics* 1009b9-12.

142 This text was found attached to works by Sextus Empiricus there is an opinion that it was written by one of Protagoras' pupils. For a translation of the text, see Freeman 1966, 417-423. For another translation, see Sprague 1972, 279-293. For a discussion of the importance of this text for understanding the sophist movement, see Groarke 1990, 49ff, Kerferd 1981, 54, 84-85, Levi 1940, Taylor 1987. For a discussion of the moral relativism presented in this text, see Barnes 1982, 516-522.

143 Diogenes Laertius, IX.51. Protagoras made this the issue of a treatise in two books, 80B5 and 80A1. According to Diogenes Laertius, the *Art of Eristics* is dedicated to "disputations on famous subjects" (80A6). On the second text, see Diogenes Laertius IX.55.

144 For these two assumptions regarding the concept of truth, see *Dissoi Logoi* IV.2 and 6-9, respectively. The text does not spell out the two assumptions explicitly, but it is a natural and direct reading in modern terms. Furthermore, without these assumptions there is no consistent way to understand the argument for the antithesis in the passage IV.6-9.

145 The distinction between the negative and the positive aspects of Greek skepticism is important for understanding it as a philosophical school. This is one of the more important points in Groarke's work. One of his goals was to show why it is foolish to reject ancient skepticism as meaningless or contradictory. See, chapter I.

146 Sextus Empiricus, *Outlines of Pyrrhonism* I.10.

147 *Outlines of Pyrrhonism* I.196.

148 My use of epistemic logic generally follows the work of Jaakko Hintikka (1962), which is still considered the most interesting and basic work. The basic notions of epistemic logic that are relevant for the following are:

149 See the discussion in Barnes 1982, 541ff.

150 One example of this kind of epistemological relativism is Democritus' philosophy. See, e.g., Barnes 1982, 559ff.

151 Megarian-Stoic logic distinguished between the negation of a proposition and the statement that the proposition is false. Here are several examples of the way this was done:

1.

$p \supset q$ is false p		p n says that ' p '		n says that ' p ' n tells the truth
' p ' is false		n tells the truth		p

See Diogenes Laertius, VII.78-79.

152 Sextus Empiricus, *Outlines of Pyrrhonism* I.201.

153 Popper 1965, 316.

154 Cf. Barnes 1982, 296.

155 Cf. Barnes 1982, 156.

156 For an analysis of Melissus' argument and for more detail on Aristocles' failure to criticize Melissus' argument see, Barnes 1982, 298ff.

157 There are a number of editions and naming systems of the writings of Sextus Empiricus. As mentioned, I follow the *Loeb* edition. For a discussion of this issue see the Introduction to the first volume dedicated to the writings of Sextus Empiricus.

n knows that p	$K_n('p')$
No one can know impossible things	$\sim \Diamond p \supset K_n(' \sim p')$

134 See note 64.

95 The concise conclusion is ' $\alpha \supset \sim \alpha \rightarrow \sim \alpha$ ', which was already known in the Middle Ages by the name *Consequentia Mirabilis* (Lukasiewicz 1972: 50-51, 80).