



WINING AND DINING\*

# A Re-examination and Reinterpretation of the Records of the Presocratics and Earlier from an ATR (Argumentative Theory of Reason) Perspective

The development of reasoning in Greece in the form of “devising and evaluating arguments intended to persuade”

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\* A fifth-century B.C. Attic kylix (drinking cup) from the Berlin State Museum, showing guests at a symposium drinking wine.

Submitted for the degree of Masters of Arts in Philosophy

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2017

## ABSTRACT

Aristotle was the founder of logic. He said that there was nothing like it earlier. Interpretations of the records of the presocratics from a classical theory of reasoning (CTR) perspective give the 'traditional account' of the development of 'Greek rationalism'. That is, an account of the Greeks becoming better at discovering the world through a process of forward inference: ratiocination. The recent argumentative theory of reason (ATR) of Sperber and Mercier provides an alternative perspective through which to interpret, or reinterpret these same records. According to the theory, the main function of reasoning is the devising and evaluating of arguments intended to persuade. This suggests a process of backward inference in order to support ideas that have arisen intuitively or in some other way. In applying this new perspective to the records, the result is that the Greeks did develop as reasoners, but more in the ATR sense until Plato. That is, the Greeks, over time, became better at devising and evaluating arguments, which were then used to support their ideas and speculations. Together these ideas and their supporting arguments became the theories the Greeks are known for. In other words, the Greeks developed first as rational persuaders with a variety of physical ideas and speculations about the world.

At some point in the development, the Greeks recognised what it is to reason and its utility in the context of the law courts and the political assembly. Over a period of time, they came to understand, formalise and teach and learn the ways and methods of reasoning in the ATR sense. Once this was understood, there is evidence that it was then consciously and deliberately applied in attempts to discover the world through the process of forward inference. This all occurred well before Aristotle. To conclude, there was not nothing at all before Aristotle. He systematised what had already been formalised in coming up with logic. But formalised methods of reasoning, both ATR and CTR, were needed in order to do this.



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# 1.0 THE INTRODUCTION

## 1.1 Preamble

The question of how we reason is being answered by psychology. The question of why we reason, its function or purpose, is also being addressed. Do we reason to conclusions or do we reason from conclusions? The first could be considered forward inference, while the second could be considered backwards inference, but it is not as simple as this. If we reason from conclusions, we know where we want to end up, the conclusion; all we need to do is decide where to start – our opening premise. If we reason to conclusions, we need to start with our opening premise, assumed or proven to be true, with no clear idea of where we want to end up. But, through the process of ratiocination, we will end up with a conclusion of one sort or another. If we are working towards a conclusion of which we have some inkling, then we are back with reasoning from conclusions.

If considering the development of reasoning, we need to consider both forward and backward inferencing, reasoning to and from conclusions. Reason has generally been considered in classical theories of reasoning as forward inference, and historical accounts of its development are from this perspective: starting with true propositions (what Aristotle calls the immediate or first premise), or ones that can be demonstrated to be true, adding more true propositions in accordance with principles of validity, resulting in true conclusions,.

One recent alternative approach resulting from the argumentative theory of reason argues that backward inferencing from intuitively arising ideas (conclusions) is perhaps more natural. Ideas arise, we take them to be true, and we then seek to persuade others to believe us (to accept them). This is where the use of reason and argument is needed. We do the bulk of our reasoning after the fact, either confabulating arguments to support our ideas and persuade others to accept them, or evaluating the arguments they are using in trying to persuade us. As a result, there is improvement in the devising and evaluating of reasons or arguments intended to persuade.

Two of Aristotle's claims are the starting point for this thesis: (1) that he invented logic, and (2) that there was nothing at all like it (logic) earlier. The account below, therefore, starts with Aristotle's ideas about logic and argument. Although his works can be used as support for classical theories of reasoning, forward inferencing, this is not unequivocal. As will be seen below, he was aware of the problem that the argumentative theory of reasoning addresses, of how (or even whether it is possible) to prove the immediate (first) premise to be true. He seems to have concluded that some ideas just arise and are taken to be true. In other words, there is some alignment between Aristotle and the argumentative theory of reasoning.

If Aristotle is considered a crucial point in the development of Greek reasoning, any account of what preceded him should seek to explain when, how and why. This has already been done, as any history of Greek philosophy text will attest. However, these accounts have interpreted the ancient texts and records from a classical theories of reasoning perspective: the Greeks developed as forward inferencers, basically from Thales onward. Aristotle and his logic can therefore be considered the culmination of this development. He systematised what had been undergoing formalisation for some time.

If we understand the argumentative theory of reasoning and then apply it to the same texts and records mentioned above, will the result be the same? Or, will it become apparent that the development was not of the Greeks as invariably forward inferencers but as initially and naturally backward inferencers? Or, somewhere in between? It may not be possible to answer this question



conclusively, but it seems it will be worth the effort. It could mean that our perception of the Greeks as natural philosophers (scientists) may need to be changed or modified to include the Greeks as masters of persuasion. The story starts with Aristotle.

## 1.2 The development of logic

William and Martha Kneale's *Development of Logic* (1962) is one of the most regularly cited histories of logic. The first paragraph gives as good a definition as any of the topic and of the significance of its 'founder', Aristotle.

Logic is concerned with the principles of valid inference; and it is certain that men made inferences and criticised the inferences of others long before the time of Aristotle. This is not enough in itself to justify us in saying that there must have been a beginning of logic before the time of Aristotle; for men may perform various activities correctly (e.g. talk English) without formulating the rules for those activities explicitly. But it is clear from what we find in Plato and Aristotle and other sources that Greek philosophers had begun to discuss the principles of valid inference before Aristotle wrote those works which came to be known as the *Organon* (Kneale and Kneale, 1962, p.1).

In the six works of the *Organon*<sup>1</sup> Aristotle develops a full set of rules and principles for logic. For him, logic is an art and not a science.<sup>2</sup> However, it is an art that can be used to discover and understand the various sciences, and an art that went on to become the tool (or instrument = *organon*) of Western thought. Before considering his logic, it might be an idea to consider his explanation for how these sorts of things arise and develop in general.

## 1.3 Aristotle's explanation of discoveries and development

Whether the developmental model in his *Sophistical Refutations* originated with him or with someone else is not mentioned. Since it is a model for discoveries, innovations, and variations in general, this should be taken to include the development of logic itself (*logos*) and the process of reasoning (*logos*).

For in the case of all discoveries the results of previous labours that have been handed down from others have been advanced bit by bit by those who have taken them on, whereas the original discoveries generally make an advance that is small at first though much more useful than the development which later springs out of them. For it may be that in everything, as the saying is, 'the first start is the main part'; and for this reason it is the most difficult; for in proportion as it is most potent in its influence, so it is smallest in its compass and therefore most difficult to see – but when this is once discovered, it is easier to add and develop the remainder (Aristotle, *Sophistical Refutations* 183b15).

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<sup>1</sup> *Categories, On Interpretation, Prior Analytics, Posterior Analytics, Topics, Sophistical Refutations*

<sup>2</sup> Science = episteme = knowledge. Art = tekhnē = doing. Knowing versus doing.

“In the case of all discoveries . . .” Aristotle is clear that this is a general model, applicable to all discoveries and developments. An original innovation or realisation is taken up and handed on, leading to the full flowering of some art or science. That there always must be a starting innovation, variation, or realisation accords with Aristotle’s ideas of knowledge and original causes; in fact, Aristotle is quite clear as to what constitutes knowledge and understanding:

In every line of inquiry into something that has principles or causes or elements, we achieve knowledge – that is, scientific knowledge – by knowing them; for we think we know a thing when we know its primary causes and primary principles, all the way to its elements (Aristotle, *Physics* 184a10).

And again, with further explanation of the nature of causes . . .

We suppose ourselves to possess unqualified scientific knowledge of a thing, as opposed to knowing it in the accidental way in which the sophist knows, when we think that we know the cause on which the fact depends, as the cause of that fact and of no other, and, further, that the fact could not be other than it is (Aristotle, *Posterior Analytics* 70b9).

Now . . . we should consider how many and what sorts of causes there are. For our inquiry aims at knowledge; and we think we know something only when we find the reason why it is so, i.e. when we find its primary cause (Aristotle, *Physics* 194b16).

“. . . advanced bit by bit . . .” There is an original cause, ‘the first start is the main part’, which, while most difficult to see, once discovered can be added to in order to develop a full account of the development. Aristotle’s developmental model should be able to account for his discoveries, the development of logic, the rules of reasoning, the principles of valid inference, in the context of earlier discoveries and developments.

Aristotle illustrates his model of development with the example of the art of rhetoric: ‘the counterpart of dialectic’ (*Rhetoric* 1354a1) and which, for Aristotle, is a ‘technical study’ “concerned with modes of persuasion” (Aristotle, *Rhetoric* 1355a4).

This [sort of development] is in fact what has happened in regard to rhetorical speeches and to practically all the other arts, for those who discovered the beginnings of them advanced them in all only a little way, whereas the celebrities of today are the heirs (so to speak) of a long succession of men who have advanced them bit by bit, and so have developed them to their present form, Tisias coming next after the first founders, then Thrasymachus after Tisias, and Theodorus next to him, while several people have made their several contributions to it; and therefore it is not to be wondered at that the art has attained considerable dimensions (Aristotle, *Sophistical Refutations* 183b25).

Rhetoric, before the sophists took it up around the middle of the fifth century, consisted of ways or methods of psychological persuasion, a form in which it continues to this day; for example, in marketing and advertising. The original cause or origin of rhetoric (or persuasion = *peitho*, the original term) is so early in history it cannot be identified. There is reference to oratory or rhetoric in Akkadian writings before 2000 BC. Corax and Tisias of Syracuse are considered the Greek

founders, but they may be mythical or even the same person. Whatever the case, rhetoric was well established by 399 BC in Athens. Aristotle's choice of it as a contrast and what he says about it was not random; the teachers of rhetoric, the sophists, were his competitors.

#### 1.4 There was nothing at all before logic

After convincingly presenting and illustrating his developmental model, Aristotle mentions the one exception, logic. Strangely and uniquely, before he did what he did, nothing existed at all.

Of the present inquiry, on the other hand, it was not the case that part of the work had been thoroughly done before, while part had not. Nothing existed at all<sup>3</sup> (Aristotle, *Sophistical Refutations* 183b34).

Moreover, on the subject of rhetoric there exists much that has been said long ago, whereas on the subject of deduction we had absolutely nothing else of an earlier date to mention, but were kept at work for a long time in experimental researches (Aristotle, *Sophistical Refutations* 184a8).

Can this be true? That with respect to logic, 'nothing at all' existed before his time and what he did originated with him, as the result of his 'experimental researches'. The Kneales' response is reasonable:

Since logic is not simply valid argument but the reflection upon principles of validity, it will arise naturally only when there is already a considerable body of inferential or argumentative material to hand (Kneale and Kneale, 1962, p.1).

Aristotle's claim is quite clear: with respect to logic, there was no original realisation or innovation earlier than his, no bit by bit development, no heirs, no examples; there was nothing that was added and developed. In other words, Aristotle is claiming to be the primary cause, the founder, the originator, if we take his words literally. In doing what he did, Aristotle could not have been systematising nothing. There must have been something prior to serve as a basis. What was it?

#### 1.5 Aristotle's syllogism

Aristotle's logic is expressed primarily in the syllogism (*sullogismos* = deduction, inference). In the *Organon* he develops a number of principles and rules. He also introduces a number of terms that have stood the test of time. The topic is introduced in his *Prior Analytics* in his usual way:

The subject is demonstration . . . and demonstrative understanding. We must next define a premise, a term, and a syllogism, and the nature of a perfect and of an imperfect syllogism . . . (Aristotle, *Prior Analytics* 24a10).

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<sup>3</sup> NOTE: All underlinings are mine. The intention is to emphasise points that I believe are important in the development of the account.

First up are definitions of universal, particular and indefinite premises:

A premise then is a sentence affirming or denying one thing of another. This is either universal or particular or indefinite. By universal I mean the statement that something belongs to all or none of something else; by particular that it belongs to some or not to some or not to all; by indefinite that it does or does not belong, without any mark to show whether it is universal or particular . . . (Aristotle, *Prior Analytics* 24a16).

A further two types of premises are the demonstrative and the dialectic:

The demonstrative premise differs from the dialectical, because the demonstrative premise is the assertion of one of two contradictory statements (the demonstrator does not ask for his premise, but lays it down), whereas the dialectical premise depends on the adversary's choice between two contradictories (Aristotle, *Prior Analytics* 24a21).

With premises understood, syllogisms (inferences, deductions) can be constructed. This is not to say that we are not capable of constructing syllogisms naturally; only that if we decide to construct syllogisms (most often *modus ponens* and *modus tollens*, i.e. syllogisms) consciously and deliberately for some reason, this is how it is done:

A syllogism is discourse in which, certain things being stated, something other than what is stated follows of necessity from their being so. I mean by the last phrase that they produce the consequence, and by this, that no further term is required from without in order to make the consequence necessary (Aristotle, *Prior Analytics* 24b19).

These syllogisms can be perfect or imperfect:

I call that a perfect syllogism which needs nothing other than what has been stated to make plain what necessarily follows; a syllogism is imperfect, if it needs either one or more propositions, which are indeed the necessary consequences of the terms set down, but have not been expressly stated as premises (Aristotle, *Prior Analytics* 24b23).

With a basic understanding of the rules of inference, syllogisms can be constructed and employed in different ways. The process, however, remains the same:

But [whether a premise is demonstrative or dialectic] will make no difference to the production of a syllogism in either case; for both the demonstrator and the dialectician argue syllogistically after stating that something does or does not belong to something else (Aristotle, *Prior Analytics* 24a25).

This can all be summarised with a clear definition of the syllogism/deduction:

A deduction, then, is an argument in which, if p and q are assumed, then something else r, different from p and q, follows necessarily through p and q (Aristotle, *Topics* 100a25).

## 1.6 Aristotle's demonstration

The definitions and explanations in the *Prior Analytics* set the scene for Aristotle's *Posterior Analytics*, where he continues to expand the concept of argument and explain its functions, specifically in the form of demonstration.

. . . subsequently we must speak of demonstration. Syllogism should be discussed before demonstration because syllogism is the general: the demonstration is a sort of syllogism, but not every syllogism is a demonstration (Aristotle, *Prior Analytics* 25b26).

Aristotle's demonstration (as opposed to persuasion) is central to his theory of teaching and learning: demonstration (*apodiexis*) is a type of deduction (*syllogism*) that he argues guarantees truth or knowledge.

All teaching and all intellectual learning result from previous knowledge. . . . Both deductive and inductive arguments proceed in this way; for both produce their teaching through what we are already aware of, the former getting their premises as from men who grasp them, and the latter proving the universal through the particular's being clear. (And rhetorical arguments too persuade in the same way; for they do so either through examples, which is induction, or through enthymemes, which is deduction.) (Aristotle, *Posterior Analytics* 71a1)

Deductive and inductive arguments can be used to produce knowledge. Rhetorical arguments proceed in the same manner, but unfortunately only produce opinion. Can knowledge be attainable through deductive and inductive arguments? We would need to know what is meant by 'knowledge' first, before being able to decide. As stated above, for Aristotle, scientific knowledge<sup>4</sup> of something means knowing the causes of it, or the reason for it being what it is.

This knowledge is attained through the particular type of syllogism called a 'demonstration'.

We shall say later whether there is also some other way of knowing; but we certainly say that we know through demonstration. By 'demonstration' I mean a deduction expressing knowledge; by 'expressing knowledge' I mean that having the deduction constitutes having knowledge (Aristotle, *Posterior Analytics* 71b17).

But, what is a demonstration?

If then knowing is the sort of thing we assume it is, demonstrative knowledge must also be derived from things that are true, primary, immediate, better known than, prior to, and explanatory of the conclusion; for this will also ensure that the principles are proper to what is being proved. For these conditions are not necessary for a deduction, but they are necessary for a demonstration, since without them a deduction will not produce knowledge (Aristotle, *Posterior Analytics* 71b20).

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<sup>4</sup> This is actually a redundancy: episteme (Gk) = scientia (L) = knowledge

More precisely, a demonstration is a syllogism with the added requirement that the premises are true.

[A deduction] is a demonstration whenever the deduction proceeds from true and primary premises or our knowledge of the premises is originally derived from primary and true premises, a dialectical deduction is the one that proceeds from common beliefs (Aristotle, *Topics* 100a27).

And, if the premises are true, the result should also be true. In other words, demonstration guarantees truth.

Since what is known without qualification cannot be otherwise, what is known by demonstrative knowledge will be necessary. Demonstrative knowledge is what we have by having a demonstration; hence a demonstration is a deduction from things that are necessary (Aristotle, *Posterior Analytics* 73a21).

One final but crucial point is that above and beyond the valid inference and the true premises, a demonstration needs to provide an explanation – causes, reasons.

A demonstration is a deduction that reveals the explanation. (Aristotle, *Posterior Analytics* 85b22).

Not all syllogisms provide explanations. For example, the following syllogism (Aristotle, *Posterior Analytics* 78b23ff) does not explain why walls do not breathe.

- (1) Everything that breathes is an animal
- (2) No wall is an animal.
- (3) Therefore, no wall breathes.

If the syllogism can be transformed so that the middle term can explain the connection between the two terms it connects, then it does explain: walls do not breathe because they do not have lungs.

- (1) Everything that breathes has lungs.
- (2) No wall has lungs.
- (3) Therefore, no wall breathes.

## 1.7 Demonstration guarantees knowledge

When the demonstration is explanatory, it provides causes or reasons, and truth is the necessary consequence. Unfortunately, this largely depends on the truth of the first premise. In theory, if it cannot be 'proved' to be true, the demonstration falls. In practice, as Aristotle points out in several places, some first premises have to be accepted on faith.

We contend that not all knowledge is demonstrative: knowledge of the immediate [first] premises is indemonstrable. Indeed, the necessity here is apparent; for if it is necessary to

know the prior things, that is, those things from which the demonstration is derived, and if eventually the regress comes to a standstill, it is necessary that these immediate premises be indemonstrable (Aristotle, *Posterior Analytics* 72b21).

The reality is that while all demonstration is meant to guarantee truth (knowledge), not all truth is the result of demonstration. There are other ways by which we may be able to discover truth, for example, pre-existing knowledge. But if a demonstration (a deduction expressing knowledge) is used, "having the deduction constitutes having knowledge" (Aristotle, *Posterior Analytics* 71b19).

The relationship between induction and deduction is that we can learn from induction but only deduction guarantees truth. Those universals we have reached through induction need to be deductively proved, and they need to be proved by the use of that type of demonstration that is explanatory. With the foundation out of the way, Aristotle moves on to his next topic, the sciences.

In theory, according to Aristotle, the sciences should be derived deductively because this supplied explanations (causes, demonstration): "A demonstration is a deduction that reveals the explanation" (Aristotle, *Posterior Analytics* 85b22). In practice, he went about it empirically. However, what can be discovered empirically can be proved deductively, after the fact. This would take some effort, but it is the basis of the scientific method.

The purpose of our discussion is to discover a line of inquiry that will allow us to reason deductively from common beliefs on any problem proposed to us, and to give an account ourselves without saying anything contradictory (Aristotle, *Topics* 100a18).

Although Aristotle's ideas are introduced above, he is not the focus of this thesis. His ideas have been introduced to give a context and a rough understanding of reason and logic in his terms. The goal of this thesis is to account for what came before. Specifically, on the basis of their surviving records, what we can conclude about the presocratics and the development of reasoning at the time. The cut-off date is 420 BC, just after public performance of Aristophanes' *Clouds* (423 BC). This is not arbitrary. The lampooning of Socrates the 'sophist' in the play indicates that an understanding of what it is to reason was known outside purely 'philosophical' circles well before Aristotle.

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## 2.0 THE QUESTIONS

### 2.1 The first question

Aristotle presents an interesting and persuasive account of his contribution to the development of logic. But, is it true? There have been a range of opinions over the centuries, but no complete agreement. It is accepted that “Aristotle was the first thinker to devise a logical system” (Honderich, 1993, “Aristotle”). But this is not to say that Aristotle both formalised and systematised reasoning (logic), as he claims, on the basis of nothing.

He drew upon the emphasis on universal definition found in Socrates, the use of *reductio ad absurdum* in Zeno of Elea, claims about propositional structure and negation in Parmenides and Plato, and the body of argumentative techniques found in legal reasoning and geometrical proof. Yet the theory presented in Aristotle’s five treatises known as the *Organon* . . . and in the *Rhetoric* – goes far beyond any of these (Honderich, 1993, “Aristotle”).

This is a sentiment to which Aristotle himself agrees elsewhere: “All teaching and all intellectual learning come about from already existing knowledge” (Aristotle, *Posterior Analytics* 71a1). One early example of argument is Gorgias’ *Encomium of Helen* (~420 BC), an epideictic oratory, where he comments on what he is doing, indicating some meta-level reflection and conceptions: “Having now finished the first section, I shall advance to the beginning of the next section, and I shall set out the causes through which Helen’s journey to Troy was likely to come about” (Gorgias, *Encomium of Helen*, 5).

A number of well-structured and persuasive *modus ponens* arguments followed by a summary indicates that rhetoric had developed to include both psychological and rational forms of persuasion – persuasion in the form of valid inference.

By this discourse I have removed infamy from a woman; I have continued in the mode I established at the beginning. I tried to put an end to the injustice of blame and ignorance of opinion; I wanted to write the discourse, Helen’s encomium and my plaything (Gorgias, *Encomium of Helen*, 21).

Aristotle’s claim that there was nothing at all is questionable, especially as the sophists had been teaching exactly this sort of thing – formalised ways of reasoning/argument – for at least a century before him, not to mention that Socrates, Plato, and the later natural philosophers, if not exactly teaching, were applying reasoning to their investigations and to their attempts to persuade others to accept their ideas.

Aristotle has two responses. The first is that the sophists weren’t teaching the art of logic as he saw it – demonstration and dialectic. The second is that they weren’t actually teaching at all.



For the training given by the paid professors of contentious arguments was like the practice of Gorgias. For he used to hand out rhetorical speeches to be learned by heart, and they handed out speeches in the form of question and answer, which each supposed would cover most of the argument on either side. And therefore the teaching they gave their pupils was rapid but unsystematic.

For they used to suppose that they trained people by imparting to them not the art but its products, as though anyone professing that he would impart a form of knowledge to obviate any pain in the feet, were then not to teach a man the art of shoe-making or the sources whence he can acquire anything of the kind, but were to present him with several kinds of shoes of all sorts—for he has helped him to meet his need, but has not imparted an art to him (Aristotle, *Sophistical Refutations* 183b36).

The response to the first response is that the students may have been copying and mimicking, which is a form of learning, but someone had to write the essays and put together the ‘contentious arguments’ in the first place. Presumably the teachers knew and were applying the art. They were doing the same thing in the same way each time, which indicates, if not a formal method, at least a ‘way’ of going about it. And it was widespread by 420 BC.

The second response may be valid. It may be, as Aristotle suggests, better to teach the art than just provide the product, but this would depend on the need. Does the student of the professors of contentious arguments want to learn how to construct arguments or to just succeed in the law courts and the assembly?

Was there already a “body of inferential or argumentative material to hand” before Aristotle? Had the principles of validity been recognised? Were those Greeks before Aristotle reflecting upon them? The Kneales mention a few earlier examples, the records of the presocratics provide more, and Aristotle himself gives a number. It would seem that if not logic, at least reason and the general principles of reasoning, were known and, more importantly, were being reflected on and applied before Aristotle. Contrary to the Kneales’ belief that there is no justification for “saying that there must have been a beginning of logic before the time of Aristotle”, there appears to be evidence that there is.

## 2.2 The second question

Does demonstration guarantee knowledge? Not all knowledge is the result of demonstration, as Aristotle observes: all demonstrations result in knowledge but not all knowledge is the result of demonstration. Aristotle comments on those who view demonstration and knowledge differently.

The other party agree [believe] that knowledge results only from demonstration, but they claim that it is possible to demonstrate everything, since they take circular and reciprocal demonstration to be possible (Aristotle, *Posterior Analytics* 72b15).

If a demonstration is produced, does it guarantee knowledge or just make it more likely? If it is possible to reason to the truth, the demonstration should be the original forward inferencing (from the immediate (first) premise to the conclusion) doing double duty as the proof as well. The truth

could arise in some other way, and if so the demonstration would conceivably be devised later, following Aristotle's rules. This seems to be what Aristotle is referring to below: 'knowledge of the immediate premises is indemonstrable'. Our senses don't deceive us but we have no way of proving what they are telling us if we can't find a first premise upon which to base our argument.

We reply that not all knowledge is demonstrative, and in fact knowledge of the immediate premises is indemonstrable. Indeed, it is evident that this must be so; for if we must know the prior things (i.e. those from which the demonstration is derived), and if eventually the regress stops, these immediate premises must be indemonstrable. Besides this, we also say that there is not only knowledge but also some origin of knowledge, which gives us knowledge of the definitions (Aristotle, *Posterior Analytics* 72b19).

What was obviously a consideration for Aristotle was that there is a point beyond which it doesn't seem possible to reason deductively. This is when and where intuitive reason "grasps the first principles" and provides us with our first (immediate) premises.

If, then, the states of mind by which we have truth and are never deceived about things invariable or even variable are scientific knowledge, practical wisdom, philosophic wisdom, and intuitive reason, and it cannot be any of the three (i.e. practical wisdom, scientific knowledge, or philosophic wisdom), the remaining alternative is that it is intuitive reason that grasps the first principles (Aristotle, *Nicomachean Ethics* VI.6.1141a7).

Demonstrative proofs are needed to support conclusions and to persuade others. What is not clear is whether these are the result of forward or backward inference (from the conclusion to the immediate (first) premise). That is, are the conclusions to be reached through a process of ratiocination (what has been termed 'Greek rationalism') or do conclusions arise in some other way with the proof (demonstration) constructed later, when and if needed? There appears to be a point beyond or before demonstration that, as Aristotle states, is intuitive inference and intuitive understanding.

It should be obvious that the answers to the questions are going to be yes and maybe. Yes: there was something before Aristotle, and maybe: perhaps demonstration can guarantee knowledge in special cases, but there are other non-demonstrative ways of discovering it. Much of what we understand about the presocratics and Greek philosophy as a whole, the 'traditional account', has been developing in the West since the early 1800s.<sup>5</sup> Recently, in the last two decades, however, there have been developments outside philosophy that could impact upon the traditional account, but this has not been tested. Therefore, the answer to the second question should remain 'maybe' until further investigation is carried out.

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<sup>5</sup> "The recovery of Aristotle" refers to an earlier similar development, spanning about one hundred years, from mid-12<sup>th</sup> century, when a significant number of early Greek texts were translated into Arabic.

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### 3.0 THE APPROACH

With logic being the rules of reasoning, the principles of validity, an understanding of reasoning should logically have existed prior to Aristotle. That is, we should be able to find examples of reasoning, recognition of what it is to reason, recognition of the benefits of good versus poor reasoning, development of better ways to reason, formalisation of these ways, and finally systematisation of these ways (logic). The question is not simply “was there reasoning before Aristotle?” but “was there any recognition, understanding, formalisation and transmission of reasoning before Aristotle?”

Since the early 1800s scholars have been providing accounts of Greek rationalism. This alone should be sufficient to answer the question of whether there was anything earlier. These scholars generally agree that this ‘something earlier’ was the development of a particular type of reasoning. What follows is a list of those texts, old and new, that are repeatedly cited in the literature – in chronological order. (Interestingly, there are several texts over 100 years in the University of Canterbury library.)

- 1837 Hegel, G. W. F. (2006). *Lectures on the History of Philosophy 1825-6*. Translated. Oxford: Oxford University Press.
- 1846 Grote, G. (1907) *A History of Greece, from the Time of Solon ...* London: George Routledge
- 1873 Nietzsche, F. (1996) *Philosophy in the Tragic Age of the Greeks*. Washington D.C.: Gateway Editions
- 1886 Zeller, E. (1931) *Outlines of the History of Greek Philosophy*. London: K Paul, Trench, Trubner & Co.
- 1901 Gomperz, T. (1901) *Greek Thinkers: A history of ancient philosophy*. London: J Murray
- 1908 Burnet, J. (1908) *Early Greek Philosophy*. Second edition. London: A and C Black
- 1928 Robin, L. (1928) *Greek Thought and the Origins of the Scientific Spirit*. Translated. New York: A. A. Knopf
- 1932 Cornford, F. M. (2014) *Before and After Socrates*. Cambridge: Cambridge University Press.
- 1939-45 Jaeger, W. W. (1939) *Paideia: The Ideals of Greek Culture*. Translated. Oxford: Blackwell.
- 1951 Dodds, E. R. (1951) *The Greeks and The Irrational*. Berkeley: University of California Press
- 1953 Snell, B. (1953) *The Discovery of Mind: The Greek origins of European thought*. Translated. Oxford: Blackwell
- 1958 Popper, K. R. (1958) “Back to the Presocratics: The presidential address.” *Proceedings of the Aristotelian Society*. Vol. 59. Pp. 1-24.
- 1962-81 Guthrie, W.K.C. (1962) *A History of Greek Philosophy*. 6 volumes. Cambridge University Press.
- 1970 Lloyd, G.E.R. (1970) *Early Greek Science: Thales to Aristotle*. London: Chatto & Windus
- 1972 Hussey, E. (1972) *The Presocratics*. London: Duckworth.
- 1974 Kirk, G.S., Raven, J.E. and Schofield, M. (1983) *The Presocratic Philosophers: A critical history with a selection of texts*. Cambridge: Cambridge University Press.
- 1975 Frankel, H.F. (1975) *Early Greek Poetry and Philosophy*. Oxford: Blackwell.
- 1975 Heidegger, M. (1975) *Early Greek Thinking*. Trans. New York: Harper & Row.

- 1978 Szabo, A. (1978) *The Beginnings of Greek Mathematics*. Dordrecht: D Reidel
- 1979 Lloyd, G. E. R. (1979) *Magic Reason and Experience: Studies in the origin and development of Greek science*. Cambridge: Cambridge University Press.
- 1987 Barnes, J. (1987) *Early Greek Philosophy*. New York: Penguin
- 1989 Barnes, J. (2001) *The Presocratic Philosophers*. London: Routledge
- 1989 Irwin, T. H. (1989) *Classical Thought*. Oxford: Oxford University Press.
- 1994 McKirahan, R. (1994) *Philosophy before Socrates: An introduction with texts and commentary*. Indianapolis: Hackett
- 1995 Vlastos, G. and Graham, D. (1995) *Studies in Greek philosophy*. Princeton: Princeton University Press
- 1999 Long, A. A. (1999) *The Cambridge Companion to Early Greek Philosophy*. New York: Cambridge University Press.

These scholars and more have added to the ‘traditional account’ of the development of Greek rationalism. They have done this using those records of the presocratics that have survived. Those in the Diels-Kranz index, (*The Fragments of the Presocratics*), first published in 1903 with later editions until 1952, those that have been discovered later, such as those found in an ancient rubbish dump in the Graeco-Egyptian town of Oxyrhynchus, those of Plato, Xenophon and Aristotle, and others. These have all been translated into English and numerous other languages.

The traditional account has been constructed on an understanding of reasoning that can be called the ‘classical theory of reasoning’ (CTR). This is the general idea that it is possible to use reasoning to discover and understand the world. That it is possible to apply the process of reasoning to move from truths about the world to newer truths on the basis of deduction alone. From the CTR perspective, reasoning and the function of reasoning were considered basically equivalent.

Mercier and Sperber, who are leading the recently arisen alternative approach, believe that philosophy and psychology are currently dominated by a classical, or ‘*Cartesian*’ view of reasoning. This view can be found with some classical Greek philosophers, but it is most famously found in Descartes: the idea that the role of reasoning is to critically examine our beliefs so as to discard wrong-headed ones and thus create more reliable beliefs – knowledge. This knowledge is in turn supposed to help us make better decisions (Mercier, [sites.google.com/site/hugomercier/projects](https://sites.google.com/site/hugomercier/projects), accessed 17/5/2017) . From this perspective the traditional account portrays the Greeks as becoming increasingly better at this type of reasoning and therefore coming up with better ideas and theories.

As to the structure of what follows: After briefly commenting on the traditional account, I introduce several recent theories that are relevant to the thesis questions. The first is the theory of cultural evolution, which can be used to account for cultural change in behaviour and artifacts, which, in our case, means the process of reasoning and its products, the ideas and theories of the presocratics. Aristotle’s earlier explanation of discoveries and development is expanded in the modern version.

Another recent theory is the argumentative theory of reasoning of Sperber and Mercier (2011, 2017), the main idea being their hypothesis that “the function of reasoning is argumentative. It is to devise and evaluate arguments intended to persuade” (2011, p.58).

While this doesn't necessarily contradict the classical theory of reasoning, it does give a significantly different perspective through which to interpret or reinterpret the records.

Theories of consciousness, introspection, self-consciousness, and cognition also contribute. At some stage, the Greeks became aware of what it was to reason and began teaching and passing it on.

The new theories suggest a new approach to reinterpreting the records in order to answer our questions. This approach will be applied to the same records used by the traditional scholars but result in new understandings. The end point, and the answer to one thesis question, remains the same – there was not “nothing at all” before Aristotle. However, a different account of how it arose emerges and brings into question whether it is possible to reason to the truth and whether this is what the presocratics were doing.

The conclusion is that the Greeks became better reasoners, but in the ATR sense initially. They came up with new ideas intuitively as well as new ways to devise and evaluate reasons and arguments intended to persuade. This was through the process of backward inferencing and the other components of the argumentative theory of reasoning. At some point they became aware of what they were doing and recognised its utility. This led to the formalisation of reason in order to teach and apply it. However, since CTR and ATR refer to the function of reasoning, it is probably more accurate to suggest that they formalised the act or process of reasoning.

At some time in the past, the idea arose with the Greek thinkers that reason could be applied in its CTR sense – ratiocination. At least, they thought this was possible – inferencing forwards to conclusions about the world. This aspect doesn't seem to be directly stated by Aristotle, but it is an idea that has come to be accepted: the world can be discovered through forward inference; others can be persuaded through backward inference. If it is not possible to deduce truth, then all that is left is persuasion. This is a somewhat different conclusion from that of the traditional scholars.

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## 4.0 THE TRADITIONAL ACCOUNT

It is not necessary to dwell too long on the traditional account of Greek rationalism. The story is known to most with an interest in this area. The main point to be made is that the traditional account has resulted from applying the CTR perspective to the records. This is understandable; until a few years ago there were no alternative theories or perspectives around. The traditional account portrays the Greek developments in the following lights:

Why do we reason? The goal of reasoning, so the story goes, is that of coming to new conclusion not through mere observation or through the testimony of others, but by drawing these new conclusions from information already available to us (Sperber and Mercier, 2017, p.52).

. . . the assumption that the main function of human reasoning is to improve on individual cognition (Mercier, 2016, p.689).

The traditional account can be summarised: Cultural changes in Greece were the result of the Greeks becoming better at applying this type of reason to questions about the world, and as they became better at it, they came up with better answers. The records of the presocratics track this development, from the simple explanations of the Milesians, to the deductive argument of Parmenides, to the complicated theories of the later natural philosophers, to Socrates and Plato. The teaching of the art of persuasion by the sophists is part of the account but a part that is often glossed over. They did not come up with any interesting or important theories and so were not considered 'real' reasoners (and later, not 'real' philosophers).

The idea is that the early Greek thinkers had some sort of special talent that set them apart from their neighbours and from those who came before. Although often explicitly denied by various writers, this view seems to creep through implicitly in comments about how philosophy and science arose. The following quotes are from only one source, but similar quotes can be found in much that has been written about the early Greek thinkers. I have chosen to use Barnes because he holds particularly strong opinions and states the case particularly clearly.

The presocratics invented the very idea of science and philosophy. They hit upon that special way of looking at the world which is the scientific or rational way (Barnes, 2001, p.xviii).

Certainly, Thales was not the first man to think about cosmogony; but what little we know of his predecessors does not contain much that is rational or philosophical in spirit (Barnes, 2001, p.12).

The presocratic philosophers have one common characteristic of supreme importance: they were rational. . . . that assertion does not imply that the Greeks, as a race, were peculiarly devoted to reason or peculiarly devoid of superstition. . . . The presocratic philosophers were not typical of their fellows: they rose above the vulgar (Barnes, 1979, p.4).

The records upon which the traditional account has been based are all we have, basically, unless another rubbish dump of papyrus is discovered. They have been worked on for some time (the originals and in translation) and scholarship has been filling the gaps and the inconsistencies in the Greek versions. The records as they stand today can be considered fairly accurate. They are the basis of the traditional account and will be the basis of the reinterpretation.

In the traditional account, 'Parmenides marks a watershed in presocratic philosophy' (numerous writers) and in Western thought. For Cornford (1912) he is the 'father of logic'. For Guthrie, "Presocratic philosophy is divided into two halves by the name of Parmenides. His exceptional powers of reasoning brought speculation about the origin and constitution of the universe to a halt, and caused it to make a fresh start on different lines" (Guthrie, 1965, p 1). And McKirahan, "Parmenides' philosophy marks a turning point in the history of thought. Neither his style of argument nor his astonishing conclusions could be overlooked even by those who strongly disagreed with him" (McKirahan 1994, p 157).

Any alternative account is going to need to address these perceptions, along with many others (e.g. "Philosophy begins with Thales" – Aristotle, B. Russell; "Thales is said to have been the first to introduce the study of nature to the Greeks" – Simplicius; "Xenophanes was the founder of scepticism and epistemology", etc.). They will not become suddenly unimportant or uninteresting; they will remain important and interesting, but for different reasons.

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## 5.0 THE RECENT THEORIES

### 5.1 Cultural change and cultural evolution

“Extinction is the rule. Survival is the exception.” Carl Sagan. *The Varieties of Scientific Experience* (2006)

Darwin’s theory of evolution has all species of organisms arising and developing through the natural selection of small, inherited variations. It is these that increase the individual's ability to compete, survive, and reproduce. The term ‘natural selection’ refers to the differential survival and reproduction of individuals due to differences in phenotype.

Within all populations of organisms there is variation and it occurs partly because random mutations arise in the genome of an individual organism and because offspring can inherit such mutations. Genomes interact with environments to cause individual variations in traits. Those individuals with certain variants of a trait that increase survival and reproduction chances above those of other individuals with other, less successful, variants, survive and hence the population evolves.

Darwin’s ‘descent with modification’ simply referred to passing traits from parent to offspring. It has expanded to refer to inherited characteristics passed on by way of genetic replication and is now accepted as covering any descent with modification, including cultural changes. "Universal" Darwinism replaces the concept of "organism" with any recognisable pattern, phenomenon, or system. The first requirement is that the pattern can "survive" (maintain, be retained) long enough or "reproduce" (replicate, be copied) sufficiently frequently so as not to disappear immediately (Hodgson, 2005, p.899).

A number of areas are being re-evaluated through the perspective of Darwin’s theory: evolutionary epistemology, evolutionary psychology – anthropology, biology, ethics, ecology, economics, and so on and so forth. Cultural evolution and cultural change are sometimes considered equivalent but in fact the former is the mechanism or process that leads to the latter.<sup>6</sup> And while it is a fairly simple matter to list cultural changes, it is not as simple to give an account of how and why they arise. The basic tenet is that cultural change is evolutionary in nature. Change in the area we are interested in will be manifested as changes in behaviour, reasoning, and the outcomes of that behaviour: artifacts: anything created by humans which gives information about the culture of its creator and users (ideas, beliefs, opinions, etc.).

Although Darwin did not specifically refer to cultural evolution, the following passage from his *Descent of Man* illustrates it well:

Now, if some one man in a tribe, more sagacious than the others, invented a new snare or weapon, or other means of attack or defence, the plainest self-interest, without the assistance

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<sup>6</sup> There could also be drift or isolation.



of much reasoning power, would prompt the other members to imitate him; and all would thus profit. The habitual practice of each new art must likewise in some slight degree strengthen the intellect. If the new invention were an important one, the tribe would increase in number, spread, and supplant other tribes. In a tribe thus rendered more numerous there would always be a rather greater chance of the birth of other superior and inventive members. . . . Even if they left no children, the tribe would still include their blood-relations; and it has been ascertained by agriculturists . . . that by preserving and breeding from the family of an animal, which when slaughtered was found to be valuable, the desired character has been obtained (Darwin 1877, 154) (*Descent of Man*, Day 32 of 151).

In this example, a new behaviour arises, is selected, and is transmitted. The outcome is superior fitness of some sort, most easily demonstrated by the results of using the snare or weapon: more food or greater security. The example illustrates the three phases of cultural evolution:

1. **Variation:** This is the appearance or arising of alternatives. It may be new behaviours that arise, and these will result in new and different artifacts. How the new behaviours arise is not important, but the genetic model of mixing and matching could be an analogy. People reach conclusions both firsthand, through experience, and secondhand, learning from others, and these can be distortions, and hence new alternatives. At times, a certain behaviour can produce a range of outcomes, artifacts. At other times, different behaviours may need to arise to produce different outcomes. In the case of the Greeks, we are considering the behaviour of reasoning and the artifacts that result: the ideas and theories that they are known for. In the example above, the variation was the invention of the new snare or weapon.
2. **Selection:** This is the phase where the alternatives are tested and either selected in or selected out. Although ultimately behaviours and artifacts should be selected on the basis of survival value, this is not always obvious nor the result of conscious and deliberate consideration. Many modern behaviours and artifacts seem to offer little apparent benefit other than looking or sounding cool, hip, or the like. 'Selecting in' refers to choosing the best from among the alternatives. 'Selecting out' refers to removing those alternatives that provide fewer benefits, with what remaining persisting. In the example above, the new snare or weapon was selected because it provided more food or offence and defence than their existing tools or behaviours.
3. **Transmission:** Without transmission nothing arising and selected would persist long enough to be considered a change. With cultural evolution, this transmission can be both vertical, from parents to offspring, and oblique, between peers not necessarily related. The modes of transmission for both behaviours and artifacts can be imitation or teaching and learning. In the example above, only imitation is mentioned, but 'showing' should also be included: showing how to make the snares and weapons, and showing how to best use them. This becomes part of the tribal knowledge.

Cultural change and cultural evolution can be used to explain the Greek 'discovery' of reason and the resultant artifacts: the Greek theories of nature. The traditional account is more of an historical account of the development of reasoning, logic, and ultimately philosophy and science. However,

any reasonably accurate account of the Greek changes should resemble cultural change/cultural evolution even if Darwinian theory is not deliberately applied. The question becomes, cultural change/cultural evolution of what? Reasoning, but what sort of reasoning?

## 5.2 The argumentative theory of reasoning

**The ability to reason has been selected for because it has given us a survival advantage.**

Reasoning is generally seen as a means to improve knowledge and make better decisions. However, much evidence shows that reasoning often leads to epistemic distortions and poor decisions. This suggests that the function of reasoning should be rethought. Our hypothesis is that the function of reasoning is argumentative. It is to devise and evaluate arguments intended to persuade. Reasoning so conceived is adaptive given the exceptional dependence of humans on communication and their vulnerability to misinformation (Sperber and Mercier, 2011, p.58).

The purpose of human conscious thought is participation in social and cultural groups, and logical reasoning depends on conscious thought (Baumeister, 2011).

This recent 'argumentative theory of reasoning' (ATR) is an alternative to the classical theory of reasoning (CTR):

As stated above, the hypothesis is that the function of reasoning is argumentative – to devise and evaluate arguments intended to persuade.

According to the theory, people reason not primarily to improve knowledge and make better decisions but to come up with and evaluate reasons in order to persuade others or be persuaded by others. This is different from the idea that reasoning enables us to come up with more accurate representations of the world.

### 5.2.a The classical theory of reasoning (CTR)

According to a long philosophical tradition, reasoning is what enables the human mind to go beyond mere perception, habit, and instinct (Sperber and Mercier, 2011, p. 58).

There is an important difference between inference and reasoning: reasoning is more than just inference. Inferencing, as I am using the term, is carried out unconsciously not as mental acts that we decide to perform but as processes that take place inside our brains, at a "sub-personal" level (in the sense of Dennett 1969). We may be aware of the outcomes of the inferences but not the process itself. "All inferences carried out by inferential mechanisms are in this sense intuitive. They generate intuitive beliefs; that is, beliefs held without awareness of reasons<sup>7</sup> to hold them" (Sperber

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<sup>7</sup> A reason: a cause, explanation, or justification for an action or event. By the use of reason, we "produce reasons in order to justify our thoughts and actions to others and to produce arguments to convince others to think and act as we suggest (Sperber and Mercier, 2017, p.7)

and Mercier, 2011, p.58). Reasoning, in their view, is not “an alternative to intuitive inference; reasoning is a use of intuitive inferences about reasons” (Sperber and Mercier, 2017, p.133).

That inferences are intuitive may contradict the idea that we form beliefs because we have reflected on reasons to accept them – not that they have arisen intuitively. According to Sperber, such beliefs, “held with awareness of one’s reasons to hold them, are better described not as intuitive but as reflective beliefs” (Sperber, 1997, p.67).

Far from denying that we may arrive at a belief through reflecting on our reasons to accept it, we see this as reasoning proper . . . What characterises reasoning proper is indeed the awareness not just of a conclusion but of an argument that justifies accepting that conclusion (Sperber and Mercier, 2011, p.58).

Classical theories of reasoning assume the function of reasoning is to arrive at more accurate representations of the world. There is a reasonable assumption that the ability to reason has survival value in that it brings about an improvement in the quality of individual beliefs and decisions. The ability to reason is supposed to lead to our beliefs about the world becoming more accurate and reliable and decisions based on them more likely to bring about our goals. Reasoning, in this view, is a tool for coming up with more useful and effective decisions. It is expected that humans who are better able to reason in this way will be better able to survive.

There are two problems with this view. The first is that we are often very bad at evaluating evidence and making rational choices, as Wason tests have shown over a number of years. As Sperber and Mercier state: “Reasoning is generally seen as a means to improve knowledge and make better decisions. However, much evidence shows that reasoning often leads to epistemic distortions and poor decisions” (Sperber and Mercier, 2011, p.57).

The second problem is confirmation or myside<sup>8</sup> bias, which is our tendency to accept evidence and arguments that support our beliefs and reject evidence and arguments that do not. This results in errors in judgement, which, when translated into behaviour, does not always bring about the expected or the best results. Reflecting on the outcomes of actions should also lead to better reasoning, but this is not always the case.

Is there survival value in a system that seems to come up with inaccurate representations of the world as a result of ‘faulty’ reasoning and confirmation bias? Surely reasoning has persisted because it has some value, perhaps a rough and ready understanding of the world is the best we can hope for. Either we are wrong in considering CTR-type reasoning faulty in some way, or we need to discover if there are any other important functions; functions that have evolved because they do do something well.

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<sup>8</sup> A term introduced by Sperber and Mercier. “Reasoning does not blindly confirm any belief it bears on. Instead, reasoning systematically works to find reasons for our ideas and against ideas we oppose. It always takes our side. As a result, it is preferable to speak of a myside bias rather than of a confirmation bias” (Sperber and Mercier, 2017, p.218).

## 5.2.b The argumentative theory of reasoning

The basis of evolutionary psychology is the idea that psychological traits that have survival value persist. That is, they are not selected against. Following from this is the idea that those human traits that have greater survival value are the ones that have the greater chances of persisting. The question, therefore, is what is the main function of reasoning and what value does it have? We may need to be clear about what reasoning is before considering its function. The same applies to the trait of confirmation (myside) bias, sometimes considered to be a flaw: What is its function? It turns out both have important functions that have significant value.

Sperber and Mercier argue that the function of reasoning is to produce and evaluate arguments about the world.

Intuitive reasoning (or, system 1 reasoning) is carried out at a sub-personal level. People may be aware of having reached a certain conclusion – be aware, that is, of the output of an inferential process – but we claim that they are never aware of the process itself (Sperber and Mercier, 2011, p.58).<sup>9</sup>

Once intuitive beliefs arise, we usually find we have reasons for them that we can rattle off if asked. But, it seems we frequently confabulate these reasons on the spot,<sup>10</sup> and they are often not the actual reasons (which we don't have access to) but the reasons we consider most apt, as if we had actually worked through a process of forward inference-type reasoning in the first place. This seems to apply to reasons as causes, in Aristotle's sense, and reasons as justifications (for actions). The interesting point about intuitive inference is that we consider it to be accurate. We have an epistemic confidence; we trust our ability to interpret the world and so we don't feel the need to reflect on these beliefs or evaluate them in order to decide whether to accept or reject them.

In fact, what we do is look for evidence and reasons that support our ideas (motivated reasoning). This is the function of myside bias, to increase our epistemic confidence and reinforce our intuitive beliefs. We accept our ideas as accurate and act accordingly. We do, at times, attempt to persuade others to accept them as well, as an important component of ATR-type reasoning is communication "in social and cultural groups".

"In evolutionary terms, the exchange of arguments improves communication by allowing messages to be transmitted even in the absence of sufficient trust" (Mercier, 2016, p.690). Some mechanisms of epistemic vigilance "focus on the source of information and help answer the question: Whom to believe? Other mechanisms focus on content and help answer the question: What to believe?" (Sperber and Mercier, 2017, p.191). Myside bias and the confabulation of reasons provides us with the content of this argumentative communication.

Argumentation would be evolutionarily stable because it makes those who engage in it better off on average: those who produce arguments are more likely to get their messages across than if they relied only on trust and those who receive arguments can accept beneficial

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<sup>9</sup> In Sperber and Mercier (2017) they offer ATR as an alternative to dual processing (system 1 and 2) reasoning.

<sup>10</sup> So-called 'moral dumbfounding' is an interesting example of this. (Haidt, 2012, p.45-47)

messages they might otherwise have rejected. As a result, argumentation allows good ideas and sound beliefs to spread (Mercier, 2016, p.690).

Collaboration provides mutual benefits in many areas: finding food, constructing shelter, defence, etc. The ability to collaborate with other members of the group leads to aligned beliefs and aligned actions. In persuading others, however, it benefits us to allocate only the minimum resources necessary. On the other hand, others need to ensure they are not persuaded cheaply. This leads to an interesting asymmetry.

Sperber and Mercier point out the significant difference between the production of reasons of our own and the evaluation of the reasons of others. On the one hand, we produce reasons and arguments to persuade others in an interactive, or deliberative setting. There is little point in producing arguments for others without first being challenged, or expecting to be challenged, or in producing counter-arguments to our own beliefs. It is a waste of resources, and in neither case would the result be others changing their minds. For this reason, producing arguments will have a strong myside bias; we are only focused on expending effort on producing arguments that support our ideas or that attack those of others (that differ from our own). In academic contexts, challenges, objections and counter-arguments are anticipated and arguments are constructed accordingly – students are directed to anticipate and address possible questions of their readers.

But, in producing these arguments, it appears that reasoners are lazy. They expend minimum effort in order to achieve their goal. They consider their possible audience and only produce arguments strong enough to persuade. This means not “attempting to anticipate what counter-arguments might be raised against their arguments”. It is easier to match the arguments to the response of the audience, through the back and forth of the interaction, to see which “arguments are effective and which arguments are countered and then to reply to the specific counter-arguments raised”. Reasons and arguments will be confabulated on the spot, and changed on the spot, as long as persuasion is the intention.

While reasoners, according to the theory are biased and lazy when producing arguments, the same cannot be said for the other half of the equation – those evaluating the arguments. “By contrast, when they evaluate others’ arguments – particularly arguments that challenge their views – they are demanding but objective” (Mercier, 2016, p.689). Early humans who automatically accepted or rejected all arguments would have long disappeared from the population. What is needed is epistemic vigilance. People will only accept arguments for the ideas they are supporting when they are of good enough quality. There is no value in being persuaded by poor arguments. There is also no value in not being persuaded by strong arguments that support ideas and beliefs contrary to those already held. A degree of rigour, and therefore expenditure of resources, is needed to evaluate the source and content of arguments intended to persuade.

The overall interaction is iterative. Reasons and arguments at the start of an interaction could be simple statements and the like. Depending on the response, these can be strengthened, becoming explanations, explanations plus evidence, weaker forms of argument (for example, argument from probability), and eventually sound deductive arguments. This would be quite an expenditure of cognitive resources. On the other side, as the reasons and arguments become stronger, the evaluating of the reasons and arguments would need to become more rigorous and critical,

eventually leading to examining the arguments themselves for validity and soundness, applying the *elenchus* (refutation) and coming up with counter-arguments.

Xenophanes was the first to mention this aspect, that through the process of production and evaluation of ideas, better ones are discovered:

By no means did the gods reveal all things to mortals from the beginning,  
But in time, by searching [inquiring], they discover better (Stobaeus, *Selections* 1.8.2 = DK 21B18).

“The argumentative theory thus predicts a fundamental asymmetry in reasoning: that reasoners are biased and lazy when they produce arguments, but objective and demanding when they evaluate others’ arguments” (Mercier, 2016, p.691) A further point is that deliberation is best done in heterogeneous groups. The least successful reasoning, in the ATR sense, is that done by the lone reasoner. A mixed group that is free to express and support their own ideas and evaluate and counter those of others is most successful (Sperber and Mercier, 2011, 2017; Mercier, 2016).

The main points of the argumentative theory of reasoning can be found on Hugo Mercier’s website, and although an ‘unpublished source’, it does nicely summarise the discussion above:

Listeners and speakers use arguments to improve the reliability of communication:

- reasons are given in order to persuade others to accept a given conclusion
- listeners can decide whether to accept the conclusion by evaluating the reasons
- finding and evaluating reasons needs the use of reason
- doing this well improves communication
- the better the argument, the more likely the conclusion is to be true, but not guaranteed
- the better the argument, the more likely the conclusion is to be accepted
- a speaker who manages to convince a listener and a listener who acquire potentially valuable information are both better off. (Mercier, <https://sites.google.com/site/hugomercier/theargumentativetheoryofreasoning>, accessed 12/2/17)

The crux of the difference between the CTR and ATR perspectives is stated above: “a true conclusion is more likely to be supported by good arguments”. A good argument cannot guarantee a true conclusion, but it makes it more likely. This would suggest truth needs to be apprehended in some other way if we want it guaranteed. This is an interesting difference from Aristotle who believed that a demonstration that accords with his criteria does guarantee truth.

From the CTR perspective, we reach conclusions through forward inference. From the ATR perspective, we construct reasons for intuitive ideas through backward inference – similar to abduction. We could either be discovering the world through the application of reasoning, particularly forward inference and deduction. Or, we could be persuading others by the application of reasoning to accept ideas that have arisen in other ways. The records of the presocratics have been interpreted from the CTR perspective. If the ATR perspective is closer to what is actually happening, it might be time to reinterpret the records. Before doing this, however, one last set of theories are needed. At some stage in the development, the Greeks became aware of what it is to reason. How do we become aware of non-conscious cognitive processes?

### 5.3 Conscious cognition theories

Many Greek thinkers before Aristotle formalised and taught methods of reasoning (the sophists, Socrates, Plato, etc.), which wouldn't have been possible without being aware, or conscious, of what it is to reason. Consciousness includes being awake, being aware of what is going on around us or of what we are doing or of ourselves. When we are conscious we are aware of being aware. We are conscious of being conscious (Ornstein, 1991, p.225).

There are many things we perceive without being conscious of them. If we go to the effort of processing these things in the brain, why do we not need to be conscious of them? The fact is that brains existed and worked well long before humans and before self-awareness. Being aware of our perceptions in many cases is the exception. "A better question might be: Why are we aware of what we are aware of? What special purpose is served by allowing a stimulus to enter consciousness?" (Ornstein, 1991, p.234).

We function without conscious thought most of the time because it is the more efficient strategy. It leaves us free to perceive what is going on in the world. If we are aware of our conscious processes, then there must be a reason for it. "This is just as Evolution intended. She wouldn't waste her resources giving us access to our internal workings if it didn't lead to increased reproductive success" (Ornstein, 1991, p.230). These conscious processes "occur one at a time, take effort, and are inefficient. They are [however] more flexible than unconscious processes" (Ornstein, 1991, p.230).

It turns out that what we become conscious of are those things that require immediate action or a decision between alternatives. In other words:

Consciousness is involved when deliberate, rather than automatic, control or intervention is needed. ... Very few of our decisions get shunted up to consciousness, only those that need a top-level decision about alternatives (Ornstein, 1991, p.227).

Alternatives includes alternative behaviours and alternative ideas and reasons. Being aware of ideas differing from our own is an example of an alternative. Not choosing is not an option if the alternatives are certain ideas or behaviours that have practical consequences. If it is possible to opt out of choosing, how do we know this is the best choice? Even not choosing is choosing.

Just as there is value in persuading others to accept our ideas, there is value in evaluating their ideas and behaviours and choosing the 'best'. In the case of ideas this will be on the basis of trust (the source) and/or reasons (the content), either those given freely or after being asked for. In answer to the question, why did you choose X and not not-X, a person will give their reasons, and in hearing these reasons, another person is able to understand, to a degree, how the reasoning is being carried out (a theory of mind).

For example, A is attempting to persuade B that 'X is the case'.

A. X is the case.	The idea believed to be true.
B. Why?	Asking for reasons.
A. Because Y.	Giving a reason.
B. Therefore, X because Y.	Reformulating the reason.
A. Yes.	
B. Or, if Y then X.	Reformulating into inference.
A. Yes, if Y then X, and as Y is in fact the case, therefore X is the case.	Continuing to a <i>modus ponens</i> argument.
B. Thanks. That makes sense.	B is persuaded that X is the case.

Since most of our thinkings about the world “take place unconsciously, automatically, and work by rules evolved over millennia”, we thus live our lives without knowing how we are doing it and what is happening to us (Ornstein, 1991, p.227), until we do. And when we do, the next question is how to use this knowing.

The trick in managing the mind is to bring the automatic reactions into consciousness (Ornstein, 1991, p.227).

Introspection is one way of doing this. When we introspect we examine or observe our conscious thoughts and feelings, our mental and emotional processes. We become aware of our cognition. As Plato asks in *Theaetetus*, “. . . why should we not calmly and patiently review our own thoughts, and thoroughly examine and see what these appearances in us really are?” (Plato, *Theaetetus*, 155).

The act of inference is often neither conscious nor deliberate, and it operates not only in conceptual thinking but also in perception and in motor control (Sperber and Mercier 2011 p. 57). Reasoning, “as commonly understood, refers to a very special form of inference at the conceptual level, where not only is a new mental representation (or conclusion) consciously produced, but the previously held representation (or premises) that warrant it are also consciously entertained” (Sperber and Mercier 2011 p. 57).

Reasoning is conscious, and consciousness is involved when deliberate, rather than automatic, control or intervention is needed, which is the case with reasoning. Once we reason consciously and deliberately, in the sense of coming up with reasons, we have a way to communicate and possibly cooperate with others. What we communicate and attempt to persuade others to accept is our model of the world: “Our normal waking consciousness builds us a model of the world, based on sense and body information, expectations, fantasy and crazy hopes, and other cognitive processes” (Ornstein, 1991, p.228). That is, what is going on and how to deal with it.

It has frequently been implied, and sometimes even pointed out, that the individual strives toward consistency within himself. His opinions and attitudes, for example, tend to exist in clusters that are internally consistent (Festinger, 1957, p.1).

However, this consistency is not always the case. Alternatives bring about a change in consciousness that can be partly explained by cognitive dissonance: “In psychology, cognitive



dissonance is the mental stress or discomfort experienced by an individual who holds two or more contradictory beliefs, ideas, or values at the same time; performs an action that is contradictory to their beliefs, ideas, or values; or is confronted by new information that conflicts with existing beliefs, ideas or values" (Festinger, 1957, p.978).

People feel a tension when they are aware of an inconsistency either between two attitudes or between an attitude and a behaviour. This tension produces some type of change to reduce the state of dissonance (Festinger, 1962, p.93).

Various strategies are used to resolve cognitive dissonance: we may keep the inconsistency in place by minimisation or avoidance, rationalisation, acceptance, or we may attempt to end it by changing the beliefs or actions, or by integration. Because cognitive dissonance is experienced as emotional discomfort, there is a natural urge to remove or resolve it. The argument is that this is done consciously, as opposed to automatically, in one or more of the following ways:

1. Change behaviour or cognition
2. Justify behaviour or cognition by changing the conflicting cognition
3. Justify behaviour or cognition by adding new cognitions
4. Ignore or deny any information that conflicts with existing beliefs (Festinger, 1957).

The result is ideas we are willing to accept. Through the process of myside bias we come up with reasons for our intuitive ideas or for the results of our resolving of cognitive dissonance that give us epistemic confidence and that can be used to persuade others. After all this effort, it turns out that we don't need to be right. If the actual aim is to persuade others to accept our conclusions, our version of the world, whether it is accurate or not isn't the point. In the end, we seem to choose the version that best suits us, that we believe most benefits us. And we feel that it will continue to be best for us if we can persuade others to accept it as well. The evidence is that whether we are actually right or wrong, we go about persuading others in the same way, by confabulating and presenting those reasons we believe are most likely to get them to change their mind. If, during this, we come to change our mind, we start again.

The reasons we give for our intuitive beliefs are confabulated on the spot. And, if they are not accepted, stronger ones are re-confabulated, on the spot. Confabulation is used not only in reasoning, but also in memory.

Memory, like the rest of our mind, did not arise to provide us with an objective and comprehensive database composed of the contents of the world. Rather, our general concern is adapting our behaviour. ... The brain changes with experience, and thence we adapt and adjust. There are no real memories as we know them. We reinterpret the hard points in memory over and over in our life, assembling our past anew throughout our lives, throughout changes in experience. ... to believe we have a complete memory of events is an illusion, as our view of our consistency is an illusion. The mind evolved to keep us adapting, not to know ourselves, so even events we are sure that we remember perfectly are just a resemblance, the mind's I deciding on the fly. Memories are a dream (Ornstein, 1991, p.191).

Reasons are like memories. They are memories of what we think we did when we were inferencing forwards when we came up with a particular idea in the first place. Or, memories of how we think the world works when we are inferencing backwards and searching for reasons for belief or justification. And, just as “memories are a dream”, reasons are dreams also. We may clearly remember working through a process of forward valid deductive inference, from a true starting premise, adding other true premises, to a true conclusion that is something new we believe we have discovered through reason about the world, and it may all be a dream, confabulated on the spot for the purpose of persuasion.

This section has covered a range of ideas and theories with respect to consciousness. The relevance to the thesis is that the Greeks went through a change between Homer and Hesiod (say) and Socrates when they became conscious of reasoning, recognised its utility, reflected on what it is to reason, and formalised and taught it. The theories above give an idea of how this proceeded. The records should give us an idea of when.

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## 6.0 THE REINTERPRETATION AND EXPECTATIONS

The theories above can explain the changes expected in reasoning in Greece before Aristotle (in fact, before the lampooning of Socrates). With the focus on the behaviour of reasoning and the artifacts, the ideas and theories produced, it should be possible to describe what the Greeks were doing in ATR terms. (Philosophy has elements of ATR and CTR-type reasoning and it is difficult to say where one stops and the other begins. However, the reinterpretation will come to suggest that CTR-type philosophical reasoning was a development from more general ATR-type reasoning.)

The three phases of cultural evolution are obvious. Considering the ideas, there will be variation in those ideas that are available for selection, and transmission of those that survive. Considering the behaviour, there will be variation in ways of reasoning, selection, and transmission of those that survive imitation or teaching and learning.

### 6.1 Variation

Ideas arise in the mind, one way or another, and most are thought to be accurate. We are sometimes deceived by mirage or illusion, but we sometimes are aware of this. That is, we are accurate in perceiving something as an illusion but not of what the actual something is. If the intention is to persuade others to accept these ideas, they must be expressed. This can be done verbally or in writing. If ideas can be expressed freely, it is reasonable to expect a greater number of ideas and a greater range of variation. As to ideas arising, it may be safe to assume that there is little variation between people and groups of people; what differs is the expressing of them. If it is not safe to express new, different, strange or unorthodox ideas safely, they will not be expressed.

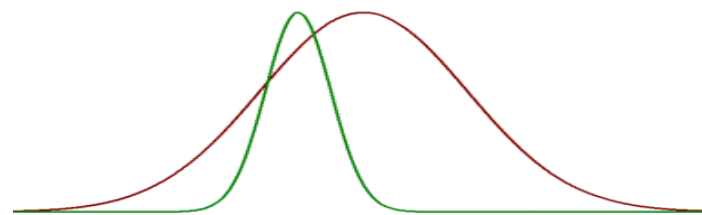


Figure 1. More ideas overall should mean a greater variation

What should also add to number and therefore variation is exposure to different ideas, of other peoples and other cultures. A significant number of Greeks in certain places and at certain times did have a relative freedom to express unorthodox ideas with the only restrictions seeming to be on ideas defamatory of the gods, which were considered not heretical but polluting. Greeks also were in contact with a range of different cultures even within Greece, with the independent and isolated *poleis* developing in 'geographic isolation'. Greeks were also in contact with non-Greek cultures. They had colonies from the east of the Black Sea, south in Egypt, to the east coast of Spain, and they traded with their neighbours. At various times they were invaded, conquered and ruled by their neighbours.



Figure 2. Greek colonies around the time of the Milesians/Xenophanes<sup>11</sup>

Consequently, there was no lack of variation in the ideas and no significant barriers to expressing their ideas for selection. There was also variation in the behaviour of reasoning. There is a significant difference between simply stating ideas, explaining them, and developing them into sound deductions, or demonstrations. Since all of these types of reasoning are natural, the variation was in the recognition of different types of reasoning under the pressure to come up with stronger types of reasons.

## 6.2 Selection

Ideas expressed are available for selection, either for or against. This is the phase of cultural evolution best explained by the ATR. A person expressing an idea would tailor the accompanying reasons to the expected audience. If these were not persuasive enough, then stronger reasons would be devised. At each step in devising and using stronger reasons the audience would also need to be more critical and objective. Ideas would be evaluated by consideration of source and content. The ideas to survive selection were those that others freely chose (for some reason or other) or were persuaded to accept.

The following diagram illustrates how this process proceeds in an iterative way. The overall goal of a person expressing an idea is to persuade others to accept it. This doesn't always happen, and if counter-arguments are strong enough, there is the possibility of the person expressing the idea changing their mind and accepting one based on a counter-argument. The overall goal for the targets of persuasion is not to be persuaded too cheaply. They need to maintain an epistemic vigilance and only accept those ideas that are accompanied by sufficient reasons (or, sufficiently strong reasons).

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<sup>11</sup> [https://commons.wikimedia.org/wiki/File:Greece\\_and\\_its\\_colonies\\_in\\_550\\_BC.jpg](https://commons.wikimedia.org/wiki/File:Greece_and_its_colonies_in_550_BC.jpg)

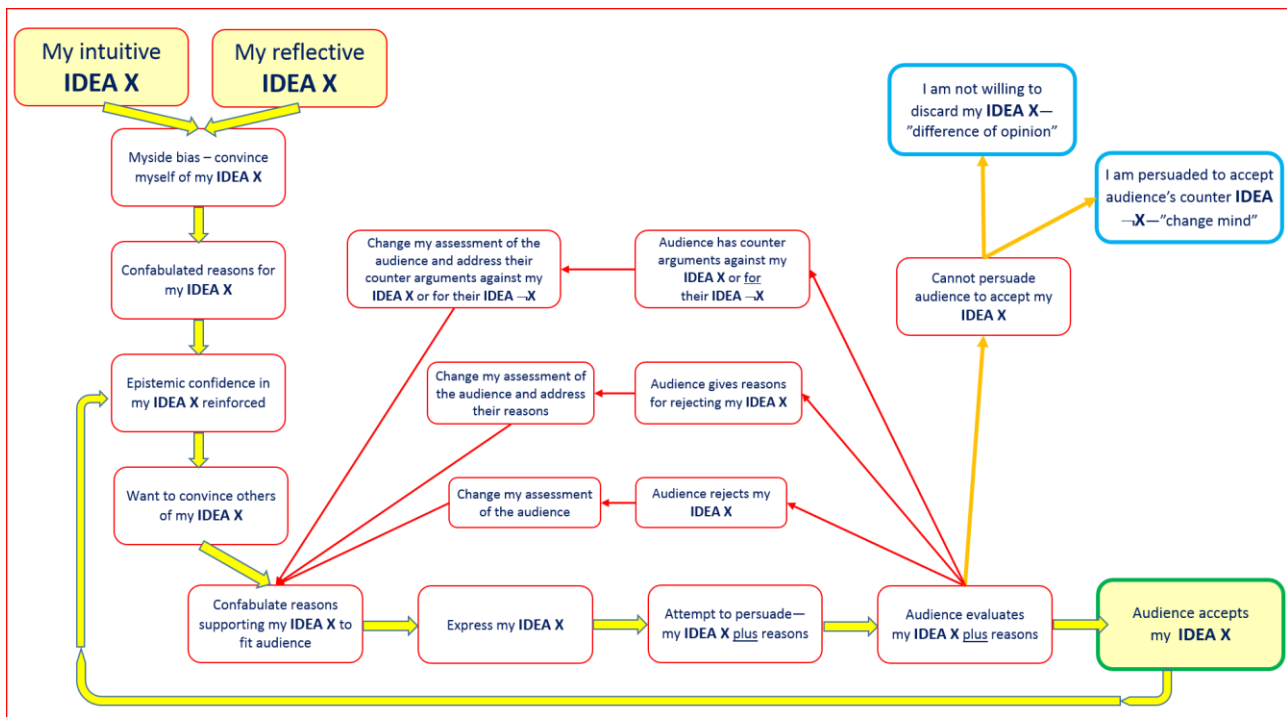


Figure 3. Persuading others to accept an idea

Where this persuasion is carried out, the deliberative setting, is also important. The ATR suggests that the best reasoning is carried out by heterogeneous groups. This was the situation in Greece. The freedom to express ideas openly and publicly meant that this was done in several settings: the symposia, public reading or reciting of texts, public displays by itinerant thinkers and poets, and in private discussion groups. All of these are well illustrated in Plato and Xenophon. Another consideration was that the Greeks were somewhat competitive. In a culture based on winning victories, as portrayed in Homer and the myths, this carried over to the deliberative setting.

On the whole, it seems that there was in Miletus a relative freedom of thought (including speculative thought) and expression in the 6<sup>th</sup> century (even though it was invaded by Cyrus I around 550 BC), and this was not the norm in the surrounding cultures. There was also wealth and leisure that meant time for speculative thought. Literacy was fairly widespread. There was the beginnings of the practice of reaching decisions through public debate conducted according to rational principles. And, there was a willingness to consider foreign ideas that resulted from contact with several other cultures, some of which invaded at times (McK, 1994, p.21-22).

There was also the idea of equality to consider. It was perceived as including the right to express and evaluate ideas. And competitiveness – a social pressure to come up with, express, and have ideas accepted. Competitiveness was mentioned by Zeno when he met Socrates in Athens in around 450 BC, and Xenophanes refers to it below:

In that competitive spirit, then, I wrote the book when I was a young man. . . . So in this respect you missed the point, Socrates; you think it was written not out of a young man's competitiveness, but out of a mature man's vainglory (Plato, *Parmenides*, 128 d7)

The amount of effort put into confabulating reasons will be based on the expected reception and evaluation of the idea. The 'tougher' the expected audience, the greater the effort put into devising

persuasive reasons, and some of the final arguments recorded for the presocratics must have been the culmination of many years of reflection and refinement. The competitive Greek culture played into this; winning by whatever means necessary appears in Homer (considered 'craftiness') and later in Plato and Xenophon. A person expressing an idea focused on acceptance while on the other side of the equation the audience focused on evaluation, not being 'tricked'.

... to avoid being victims of misinformation, receivers must therefore exercise some degree of what may be called *epistemic vigilance*. The task of epistemic vigilance is to evaluate communicator and the content of their messages in order to filter communicated information. (Sperber and Mercier, 2011, p.60)

To the Greeks, being tricked into accepting ideas was equivalent to losing, to being outthought. One side was fighting to persuade and the other side was fighting to evaluate accurately. This comes through in the records of the time in three settings in particular that have a particularly Greek flavour: public readings and recitations, testing of visiting thinkers, and symposia. All are referred to in Plato and Xenophon, who paint clear pictures of the competitive side of these interactions.

The first is the public reading of texts by the author, or sometimes texts recited from memory. One case, which will be referred to again below, was Zeno reading his book of arguments in Athens.

Antiphon said that [Parmenides and Zeno] were staying with Pythodorus, outside the city wall in the Potter's Quarter, and that Socrates had come there, along with a number of others, because they were eager to hear Zeno read his book, which he and Parmenides had just brought to Athens for the first time. Socrates was then quite young (Plato, *Parmenides*, 127 c1-4).

Second is the testing of those itinerant thinkers and teachers, either after they had read or recited, or later at someone's home – often the home of someone hosting the visitor. From the descriptions Plato gives, this testing or clarifying was an important part of the culture, or at the least, of the 'philosophical' sub-culture that was developing; people wanted to be sure they had the story right. In the following quote, Socrates approaches and tests Zeno immediately after he finished his reading – during 'question time':

Then Socrates, after he had heard it, asked Zeno to read the first hypothesis of the first argument again; and when he read it, Socrates said, Zeno, what do you mean by this; if things are many, they must then be both like and unlike, but that is impossible, because unlike things can't be like or like thing unlike? That's what you say, isn't it? (*Parmenides*, 127 d5-e4).

The third were the symposia, drinking parties, which followed a fairly set process and only started to consider expressing and evaluating ideas after the formalities were over. There may have been drinking involved, but the discussions could be serious and often memorable, as the following passage illustrates.

Apollodorus, I've been looking for you! You know there once was a gathering at Agathon's when Socrates, Alcibiades, and their friends had dinner together; I wanted to ask you about the speeches they made on Love. What were they? I heard a version from a man who had it from Phoenix, Philip's son, but it was badly garbled, and he said you were the one to ask. So please, will you tell me all about it? After all, Socrates is your friend – who has a better right than you to report his conversation? (Symposium, 172 b1-8).

The records give the impression that some of the arguments were the result of many years' work, trying out arguments, responding to and reflecting on feedback and counter-arguments, and devising stronger arguments. This also applies to the behaviour of reasoning. The new ways of reasoning, in terms of new ways of devising arguments, that arose and persisted brought about an interesting collection of new ideas and theories. What is expected in a development of ATR-type reasoning is the appearance of stronger, more persuasive reasons rather than more accurate ideas.

The following diagram illustrates the 'ramping up' of reasons and arguments in the face of rejection. Due to selective laziness, the person expressing the idea and attempting to persuade will not go to all the effort of devising the strongest reasons and argument first if not needed. This will only happen if the idea is rejected and if the person is fairly insistent, with his or her mind set on persuasion. This ramping up could be in a single interaction or over time with a variety of audiences, and this is again one of the important aspects of the Greek situation. Some of the recorded ideas and arguments must have been the result of many years of reflection and refinement. A modern equivalent can be found in academic journals.

This ramping up can only be done by someone with a toolbox of different types and strengths of reasons and arguments. The records show that the Greek toolbox developed in the century or more before Aristotle.

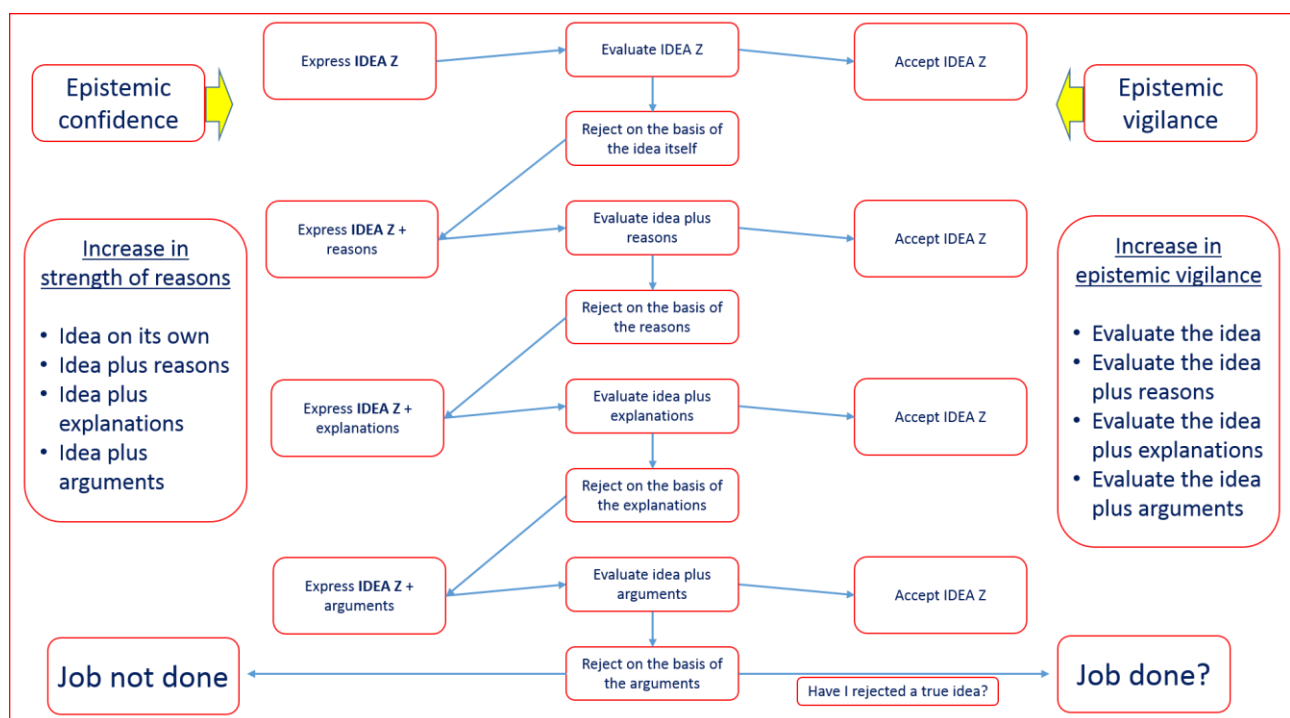


Figure 4. The ongoing tension: epistemic confidence and the desire to persuade versus epistemic vigilance

### 6.3 Transmission

The ideas that survive selection are those that others are persuaded to accept. (This is not the only way ideas are selected. Some are copied or imitated without any active need for persuasion at all. All that is necessary is exposure. That is, someone expresses a new idea and it is taken up by others. There will be reasons for this, based on fitness and survival, but this is a different topic.) Once accepted, the ideas are transmitted vertically and obliquely. In Greece, the records suggest this was something that was a common occurrence and that led to the development of their understanding of the world. Travellers would be welcomed into a *polis* and accommodated and entertained, perhaps only by a certain circle, in the expectation of being brought up to date with the latest ideas.

The actual ideas that were being transmitted may have been old news and superseded by newer ones, but they were passed on all the same because there is also value in transmitting obsolete, wrong ideas – they become part of the tribal memory. We wouldn't know anything about Thales and his water, for example, otherwise.

Since the behaviour of reasoning was of benefit – it caused a person to become more persuasive; to get more of his or her ideas into the group – it was transmitted at first by imitation. However, once it was recognised for what it was and its utility, some effort was put into discovering how it worked, and then this was actively taught and learnt, much like Darwin's example above. The records are testament to the transmission of the ideas. Plato's dialogues are also good illustrations of how this transmission occurred.

Overall, the context in Greece meant that ATR-type reasoning arose, developed, and was passed on. This quotation from Mercier applies to the situation in Greece with respect to the second phase:

. . . the argumentative theory of reasoning suggests that the main function of reasoning is to exchange arguments with others (Mercier, 2016, p.689).

The theories of conscious cognition above give an idea of how the Greeks became aware of what they were doing. The records give a demonstration.

### 6.4 The reasons

Reasons – organised answers to the question “Why does (did, should) X do Y?” – vary between formulas and cause-effect accounts in one dimension and between popular and specialised statements on the other. Conventions, explanatory stories, codified justifications, and technical accounts all qualify as reasons (Tilley, 2004, p.445).

The diagram below from Sperber and Mercier (2017) gives an idea of the uses of reasons as well as the types.



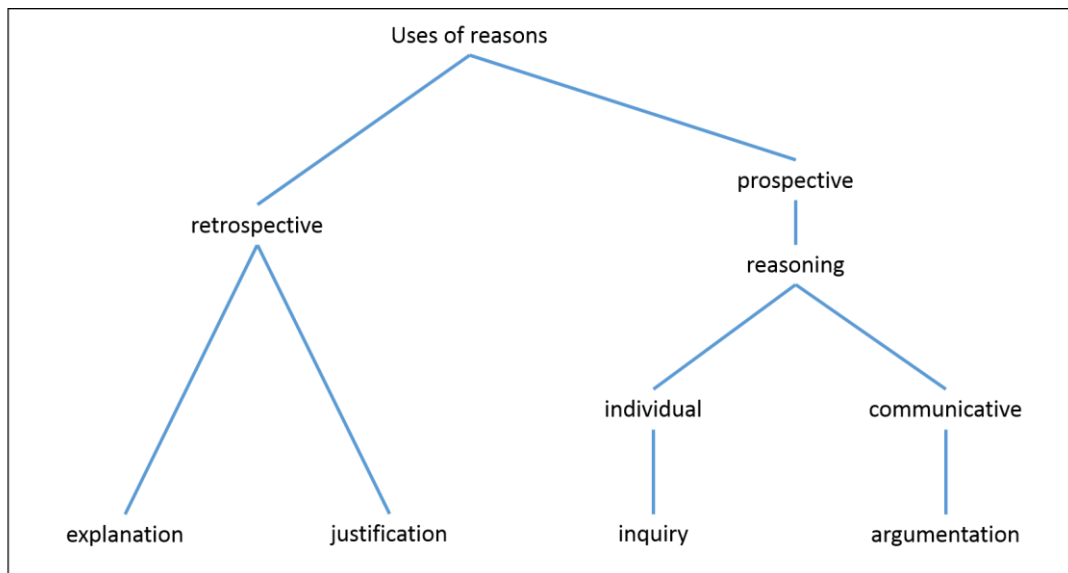


Figure 5. The uses of reasons (Sperber and Mercier, 2017, p.129)

In answer to how and why questions reasons will be provided in the form of explanations and arguments. Explanations can be used to explain why and to explain how. Arguments can be used to argue that. One idea that persists through the records of the presocratics is that of the *arché*. If, for example, the idea is that the *arché* is water, a number of questions would follow:

Why is it water?	An explanation or an argument that it is water.
Why should I believe it is water?	An argument justifying the belief.
How did water come to be the <i>arché</i> ?	An explanation of how it came to be water.
How do things come to be of or from water?	An explanation of how things come to be of or from water.
Why do things come to be of or from water?	An explanation of why things come to be of or from water. (Eternal motion or something like it.)

The simplest strategy is to consider reasons to be answers to how and why questions. Their form will vary, and this is what we are interested in.

## 6.5 The *arché*

One consistent question until the sophists and Socrates was of the essential nature of the world – the *arché*, initially referring to the ‘beginning’, ‘origin’, or ‘source of action’ and later, after Anaximander, including ‘first principle’ or ‘element’.

Let us take as associates in our task our predecessors who considered the things that are and philosophised about the truth, for it is clear that they too speak of certain principles and causes . . . (Aristotle, *Metaphysics* 1.3 983a26).

The ideas changed over time, beginning with Chaos in the mythological accounts, to water, *aer*, and so on. What didn’t change was the concept of an *arché*.

Of those who first pursued philosophy, the majority believed that the only principles of all things are principles in the form of matter.

For that of which all existing things are composed and that from which they originally come to be and that into which they finally perish – the substance persisting but changing in its attributes – this they state is the element and principle of the things that are. . . . For there must be one or more natures from which the rest come to be, while it is preserved (Aristotle, *Metaphysics*, 983b6 = DK 11A12).

This basic thing needed to be material as the idea of the insubstantial did not arise before the atomists posited ‘the void’. It also needed to address the points in the quote above. Any ideas on the *arché* expressed would presumably need to be accompanied by reasons; otherwise, why would anyone accept them? Since ideas about the *arché* is the consistent factor, we can focus on the variables, which are the types of reasons used to support them. This is where we expect to find the changes, in how the reasons were constructed and in what the results were, the ideas plus reasons: the theories.

## 6.6 The expectations

Of the two basic types of reasons, explanations are most useful in accounting for the natural world and arguments in accounting for actions. Questions about the *arché* could be answered by explanations and/or arguments. Questions about other things, including actions, likewise. The context would determine whether to explain why something is the case or to argue that something is the case. Above and beyond explanations, however, is the question of why someone should accept or believe. Since ‘believe’ is a verb<sup>12</sup> (or, ‘choose’ to believe), we would probably expect an argument. These appear in the records long before the presocratics, but it was the presocratics who put them to use in a new way.

‘Why should I believe you?’ Explanations and arguments often cycle.

For example:

Someone notices it is wet outside and asks the question, “Why is it wet?”

The answer could be “Because it is raining.” This can be considered a ‘why explanation’.

The response could be, “How does raining lead to it being wet?”

In this case, the answer would be a cause and effect explanation and considered a ‘how explanation’.

The next question may be, “Why should I believe you?”

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<sup>12</sup> Verb = a word used to describe an action, state, or occurrence.

Now an argument is needed. “You should (choose to) believe (verb = action) me because ...”

Both types of reasons are found in the records. The development of interest is their increasing persuasive powers. By starting with ideas of the *arché*, this development becomes apparent. At each iteration, more persuasive reasons seem to be needed in order to put previous ideas to rest. Since a sound argument makes truth more likely (from the ATR perspective; from the CTR perspective, a sound argument makes truth certain), once this step was reached what was left for the presocratics?

## 6.7 Summary

The intention of this slightly long section is to explain clearly what we can expect to observe in re-examining and reinterpreting the records. Circumstances in Greece match those described by Sperber and Mercier as conducive to ATR reasoning. This statement applies to all cultures, not just Greece, but it is Greece, however, that we are interested in. The other theories above describe the developments and changes that can be expected. Overall, we should be able to track Greek reasoning in terms of Greek development of better reasons supporting their speculations, and better, more critical evaluation of the same. There are many records from before the presocratics and this is the best place to start, when reasoning was being carried out naturally.

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## 7.0 THE MYTHOLOGISTS AND MIXED-THEOLOGIANS

### 7.1 Introduction

The earliest of the Greek records, including Homer and Hesiod, as well as those of what Aristotle called the 'mixed-theologians', Alcman of Sparta in the 7<sup>th</sup> C and Pherecydes of Syros in the 6<sup>th</sup> C are the starting points. The *Iliad* and *Odyssey* were the basis of Greek education and were memorised, copied, and expressed in various ways.

Homer and Hesiod and the like provide good examples of reasoning, explaining how and why and using arguments to justify actions. Homer and Hesiod were accepted on the basis of trust in the source. It was assumed that Homer's stories came from the gods and from those who were present. Hesiod refers to being guided by the Muses. It is also made clear by the writers of the myths that their accounts 'come from the gods'. In terms of types of reasons, there are the following:

1. Homer's Trojan War and the Return of Odysseus – explanations of how and why and arguments for actions
2. Hesiod's *Theogony* and *Works and Days* – explanations of how and why and arguments for actions
3. The *Hymn to Hermes* – argument from probability

Since the thread we are following is the *arché*, with the earlier meaning of 'beginning', 'origin', or 'source of action',<sup>13</sup> the place to start is Hesiod's *Theogony*. Early examples of Greek reason before "philosophy began with Thales on 28 May 585 BC"<sup>14</sup> are easily found in the myths supporting ideas on *cosmogony*, how the world (cosmos) came to be; *cosmology*, the nature of the cosmos; *theogony*, how the gods came to be; *theology*, what, how and why the gods do what they do; and models or guides to behaviour. Creation myths are universal: from chaos, the earth diver, emergence, *ex nihilo* (out of nothing), and the world parent. Greek creation myths follow the chaos model, as most clearly explained by Hesiod.

### 7.2 The *arché*—Hesiod's *Theogony*

The basic premises for Hesiod's *arché* are (1) everything in the world is one god or another, and (2) gods beget gods. That is, whatever comes into being is a new god, the result of intercourse between 'earlier' or 'older' gods.<sup>15</sup>

Verily first of all did Chaos come into being, and then broad-bosomed Gaia [earth], a firm seat of all things for ever, and misty Tartaros in a recess of broad-wayed earth, and Eros, who is fairest among immortal gods, looser of limbs, and subdues in their

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<sup>13</sup> Meaning later expanded, by Anaximander, to include 'first principle' or 'element'.

<sup>14</sup> The date can be confirmed: an eclipse of the sun 'predicted' by Thales.

<sup>15</sup> Theoretically, gods cannot be earlier or older – they just are. This thought is found in Xenophanes, late 6<sup>th</sup> century.

breast the mind and thoughtful counsel of all gods and all men. Out of Chaos, Erebus and black Night came into being . . . (Hesiod, *Theogony*, 116).

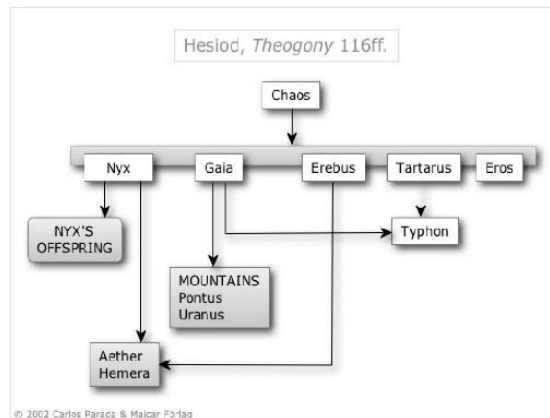


Figure 6. One suggested family tree from Hesiod<sup>16</sup>

Even in the myths, there is variation, selection and transmission. Hesiod provides a mythological account synthesised from a number of local accounts of how the world came to be. In making the story more coherent and by removing many of the contradictions and inconsistencies in Homer's account, he makes the account more persuasive. In his *Theogony*, how gods begat gods and consequently brought into being what they personified reads as a genealogy. Hesiod's reasons are analogical: growth in nature is observed as animals mating and begetting offspring. Why not expand the idea to include everything?

Greek ideas changed over time from accounts of older or more primitive aspects of the world, as they saw them, to younger or more developed or complex ones – but all revolving around the personification of gods. The older gods form the bases and the newer gods add the adornments (*kosmos*). As new aspects of the world and the human condition were noticed and named, new gods were added or repurposed – for example persuasion and Peitho. Presumably the Greeks decided that if there were older and newer gods, then logically there had to be an earliest, most primitive one; for the Greeks this was Chaos.

Hesiod explains how the world came to be, and he explains why. That is, why certain gods chose to mate with certain other gods. It is analogical and based on human ideas and emotions, but it could be summarised as the mating choices resulting from considerations of what would provide the greatest benefits. Hesiod's account must have been accepted for a number of reasons: trust in the source, authority, coherence and clarity, persuasive analogy. And perhaps, the fact that there were no viable alternatives.

### 7.3 Arguments justifying actions in Homer

Odysseus' argument for Achilles re-joining the war and Achilles' counter-argument: why he is rejecting the plea and not re-joining are found in the *Iliad*. These arguments are of the same form as later 'sophistic' arguments, the difference is that there is no indication that the author was

<sup>16</sup> <http://www.maicar.com/GML/MythsCreation.html>

consciously and deliberately devising them. He was recording the type of reasoning used to persuade at the time that came naturally.

In Book IX of the *Iliad* there are three speeches involving Achilles. All involve reasons and arguments of different types, some for the first time.

There is an example of a well arranged speech by Odysseus at 9.225-306, in which can be found the various parts that the sophists were later to teach. He starts with a prooemium, seeking the good will of Achilles by thanking him for his hospitality. He next states his proposition (228-31), that the Greek ships will be destroyed unless Achilles returns to defend them. There is then a brief narration of how the situation developed (232-46), and then a specific demand that Achilles return (247-48). As proof, Odysseus cites four reasons why Achilles should return to the war (249-306). (Kennedy, 1994, p.14)

(Reason 1) An appeal to character:

Achilles will come to regret not helping when he could.

(Reason 2) An appeal to authority:

Achilles' father advised him to do certain things when he initially set out for Troy.

(Reason 3) An appeal to reward:

A list of gifts Agamemnon is willing to make if Achilles returns.

(Reason 4) An appeal to emotion:

And the "last argument, functioning as an epilogue, is emotional; Hector is said to be boasting that no one is his equal, a slur on Achilles" (Kennedy, 1994, p.14).

Achilles' counter-argument:

Achilles responds with a counter-argument of his own. He will not re-join the war for a number of reasons, which present as inferences: "If I were to re-join the war, then ..." These can be restated as 'because' reasons: "I will not re-join the war because ..."

The arguments in Book IX can easily be formalised into deductive arguments, but this is not necessary. They function perfectly well as they stand.

#### 7.4 Arguments justifying actions in Hesiod's *Work and Days*

The gods were the world, but the gods also acted in and on the world, and an understanding of what they did and how and why they did it allowed for some sort of predictive ability. Hesiod provides this information in his *Works and Days*, a farmer's almanac, with farming and moral

advice, that he wrote for his brother. The poem provides information on god-world and god-human interactions.

Gods reward or punish depending on whether they are pleased or displeased, so it obviously best to act in ways that please the gods. The problem is, of course, knowing what pleases the gods. Hesiod lists what pleases and displeases the gods and their likely responses. The starting premise could be, 'gods reward those who please them and punish those who displease them'.

Giving straight judgements to foreigners pleases the gods:

Those who give straight judgements to foreigners  
and citizens and do not step at all aside from justice  
have a flourishing city and the people prosper in it.  
There is Peace, the nurse of children, throughout the land, and wide-seeing Zeus  
Never ordains harsh war for them (Hesiod, *Works and Days*, 225).

Having thoughts of evil violence and cruel deeds displeases the gods:

But for those who have thoughts of evil violence and cruel deeds,  
Wide-seeing Zeus son of Kronos has ordained justice.  
Often indeed the entire city of an evil man suffers,  
When he sins and plans wicked deeds.  
The son of Kronos brings a great disaster on them from heaven ... (Hesiod, *Works and Days*, 338).

## 7.5 How to farm

The farming instructions are the distillation of wisdom acquired over time and through trial and error. There are a number of inferences in the form of rules or injunctions, often supported by empirical evidence as reasons. Many of these are in the form of enthymemes, a syllogism with a missing premise, usually expressed as 'A because B'. They take the form of 'If A then B because C'.

For example, 'Once the rains arrive, plant your corn because this will lead to a good crop'. The inference that has become known through trial and error or experience is 'If the rains have arrived, then plant your corn' and the reason is because it will lead to a good crop.

Reformulated:

"Why should I plant my corn when the rains arrive?"

"Because it will result in a good crop." (Explanation why)

"OK, but how does planting my corn when the rains arrive result in a good crop?"

"Explanation how."

The reasons are incorporated in the inference and nothing more should be needed on order to persuade the brother to accept the injunction. The same applies to the following examples:

Do not put your work off till to-morrow and the day after; for a sluggish worker does not fill his barn, nor one who puts off his work ...

When the piercing power and sultry heat of the sun abate, and almighty Zeus sends the autumn rains [in October] ... when it showers its leaves to the ground and stops sprouting, the wood you cut with your axe is least liable to worm.

Let a slave follow a little behind with a mattock and make trouble for the birds by hiding the seed ... (Hesiod, *Works and Days*, 383-465)

For each injunction, the reason given appears to anticipate expected the 'Why should I do what you suggest?' question. Knowing his intended audience and in accord with the principles of motivated reasoning and selective laziness, he has devised his arguments accordingly. He also has authority and trust on his side as well.

## 7.6 Argument from probability in the *Hymn to Hermes*

In a later record, the 'Homeric' *Hymn to Hermes*,<sup>17</sup> can be found other arguments. It seems that one-day-old Hermes is being accused by Apollo of steaking Apollo's cattle. To this accusation, Hermes responds that "he knows nothing about the cattle and employs what is apparently the earliest specific example of argument from probability (*eikos*) in Greek: Is he, a baby, 'like' (*eoika*) a cattle thief? That is, is it "probable" that he could have stolen cattle?" (Kennedy, 1994, p.14). And later, before Zeus as judge, Apollo has evidence of the cows' tracks and a farmer who witnessed the deed (who Hermes had attempted to bribe), "but Apollo does not develop any arguments from his evidence" (Kennedy, 1994, p.14).

## 7.7 New type of explanation of the mixed-theologians

One response to purely mythological ideas were mixed-theological theories. However, evidence in the records is sparse so they may not have been mainstream. The variation was that instead of gods begetting gods, some changes were posited as the result of gods acting directly on the world in some way. This was a sort of god-physical world interaction and a new type of explanation, not a rejection of the gods, and so may not have been considered unorthodox or irreligious. Aristotle only mentions this change in passing:

... since the 'mixed' theologians, those who do not say everything in mythical form, such as Pherecydes and certain of the others, and also the Magi ... (Aristotle, *Metaphysics*, 1091b8).

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<sup>17</sup> Probably 6<sup>th</sup> C



## 7.8 Semi-physical explanations

The idea of philosophy beginning with Thales is due to him coming up with non-mythological, physical answers to questions about the world. The intermediate step were the mixed-theologians whose reasons were explanations of interactions between gods and the physical world. Plato had more to say about it later, but the first example in the records is from Alcman of Sparta, around 620 BC, and although it provided its own explanatory reasons, there was nothing to justify them.

For when matter began to be arranged there came into being a kind of way [*porus* or Porus], as it were a beginning [or origin, *arché*]. So, Alcman says that the matter of all things was disturbed and unmade; then someone came into being who was arranging everything, then a way came into being ... when Thetis had come into being there became beginning and end of all things, and the totality of things has a similar nature to that of the bronze material, Thetis to that of the craftsman, and the way and the limit to that of the beginning and the end . . . (Alcman Fr. 3 (Page), col. ii, 7-20 (Kirk, Raven and Schofield, p.47))

In this passage, and another where Thetis stirs the ocean to create new stuff, is the new idea that things come to be not through reproduction but through production, a direct interaction between the gods and the physical world. (Another indication of this change, according to Kirk, Raven and Schofield, is in translating whether to capitalise the names in the passage. Is the reference to the god Porus, god of the way or means of passage, or to *porus*, the passage itself?)

Alcman of Sparta was known as a lyric poet and his cosmogonical side was unknown before the fragment above was first published in 1957.<sup>18</sup> That his theory has not been previously mentioned suggests he had little influence in this area. He may have only been recording some current ideas he found interesting that had arisen in Sparta (not known for this sort of thing) or that had arrived in Sparta from elsewhere. That main point is that an alternative account had arisen.

The Pherecydes (of Syros) mentioned by Aristotle had stories of a similar ilk, of gods fashioning the world out of material. Since Pherecydes' dates match those of Anaximander – mid-6<sup>th</sup> C, there may have been some sharing of ideas, perhaps of things arising from the *arché* that did not rely on the gods completely. While Pherecydes was focusing on complete accounts of the world, Anaximander and the Milesians were focusing on the *arché* and the mechanism of creation. Or at least, that is how they have been portrayed. The main point is that new ideas were starting to arise as alternatives to tradition, and consequently new reasons were going to need to be devised to persuade others to at least consider them. That is, not automatically reject them.

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<sup>18</sup> The papyrus fragment was found in a rubbish dump in Oxyrhynchus in Egypt around 1855.

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## 8.0 THE MILESIANS

### 8.1 Introduction

The main point of the argumentative theory of reasoning is that reasoning is an important component of communication and cooperation. This applies to the Milesians, three early Greek thinkers from the Ionian *polis* of Miletus.

The Milesians were speculating on the nature of the world, which was not new, nor was reasoning and evaluating. What Thales did that was new was to proffer non-mythological answers in the form of physical explanations. He is often referred to as the founder of philosophy on the basis, but this seems somewhat unfair to those who came before him.

Thales is said to have been the first to introduce the study of nature to the Greeks; although many others came before him, as Theophrastus thinks, yet he so far excelled them as to eclipse all his predecessors. But he is said to have left nothing behind in writing except the so-called *Nautical Astronomy* (Simplicius, *Commentary on the Physics* 23.29-33).

Thales was a man of practical wisdom, one of the so-called Seven Sages of early Greek history, and he was regarded by posterity not only as an original contributor to science and philosophy, but also as an astute statesman (Barnes, 2001, p.9).

That is, his ideas were about the physical world as it was observed; it was still divine, but not personified. For this new type of answer he needed different types of reasons – no more gods begetting gods. Although Thales' reasons for his ideas are almost non-existent in the records, those of his followers show significant developments. Myside bias, selective laziness and the demands of the audiences can account for these.

### 8.2 Thales of Miletus (c.624-c.546)

Thales was a well-known sage; he was involved in politics, astronomy, geometry and business speculation, among other things. That he did not give reasons supporting the ideas he is known for is unlikely. More likely is that they were not remembered or recorded. That he was able to give reasons is shown by a number of aphorisms ascribed to him:

Of existing things, god is the oldest – for he is ungenerated.

The world is the most beautiful – for it is god's making.

Space is the greatest – for it includes everything.

Mind is the swiftest – for it runs through everything.

Necessity is the strongest – for it controls everything.

Time is the wisest – for it discovers everything.

... The motto ‘Know Thyself’ is his, though Antisthenes in his *Successions* says that it was Phemonoe’s and that Chilon appropriated it (Diogenes Laertius, *Lives of the Philosophers* 1 22-28, 33-40).

### 8.2.a Thales’ *arché*—All is water

However, they do not all agree about how many or what kinds of such principles there are, but Thales, the founder of this kind of philosophy, stated it to be water (Aristotle, *Metaphysics* 1.3 983b18 = DK 11A12).

It is not clear whether Thales considered things were of or from water. It is also not recorded why he thought “water is the *arché*”. Since it is natural to ask for reasons, and since there were none recorded, Aristotle proposed a few of his own:

He may have gotten this idea from seeing

- a. that the nourishment of all things is moist, and
- b. that even the hot itself comes to be from this and lives on this (the principle of all things is that from which they come to be) – getting this idea from this consideration and also
- c. because the seeds of all things have a moist nature; and
- d. water is the principle of the nature of moist things (Aristotle, *Metaphysics* 1.3 983b6–27 = DK 11A12).

Thales may have used reasons of this sort. Aristotle’s proposed reasons are important in that he started a trend that has continued. Modern writers continue to confabulate reasons on behalf of early Greek thinkers, based on what they should have been thinking, often in the form of clear deductions that couldn’t realistically have been in use before Parmenides and the Eleatics.

Thales is not recorded as refuting earlier ideas about what is, even the mythological accounts. There is no record of him considering how things come to be from what is, nor the mechanism of change. Of course, these would be questions asked by his audience, and so he must have given some reasons for his ideas.

### 8.2.b The earth rests on water

This is why he declared that the earth rests on water. (Aristotle, *Metaphysics* 1.3 983b21 = DK 11A12).

Some say [the earth] rests on water. This is the oldest account that we have inherited, and they say that Thales of Miletus said this. It rests because it floats like wood or some other

such thing (for nothing is by nature such as to rest on air, but on water). He says this just as though the same argument did not apply to the water supporting the earth as to the earth itself! (Aristotle, *On the Heavens* 2.13 294a28 = DK 11A14).

That the earth rests on water is also ascribed to Thales. In the form above, Aristotle seems to be implying the following: All is of or from water because the earth rests on water. This doesn't seem particularly persuasive. Perhaps there is something missing, or perhaps Thales never meant the second part to stand as the reason for the first part.

This can be restated simply (and crudely): the earth rests on water because it floats on water like wood floats on water. Since the mythological accounts have the earth surrounded by water, this is not a completely new idea. Aristotle suggests that something is amiss with Thales' reasoning. If the earth rests on water, then what does the water rest on? This is a question that his successors spent some time and effort answering.

### 8.2.c The soul produces motion

From what is related about him, it seems that Thales too held that the soul is something productive of motion, if indeed he said that the lodestone has soul, because it moves iron (Aristotle, *On the Soul* 1.2 405a19–21 = DK 11A22).

Aristotle and Hippias say that [Thales] gave inanimate things too a share in soul (*psuche*), taking his evidence from the magnetic stone and from amber (Diogenes Laertius, I.24 = 11A1).

Another set of arguments from Thales concerns souls and gods, which suggests he did not reject the gods and customary accounts. Things were still divine; it was the form of the divine that he decided was water. Various writers have transformed these fragments into formal arguments, but this is not really necessary: the intention comes through fairly clearly.

These two fragments are examples of analogical explanation, defined as “a comparison between one thing and another, typically for the purpose of explanation or clarification”.

An analogical argument is an explicit representation of a form of analogical reasoning that cites accepted similarities between two systems to support the conclusion that some further similarity exists (Bartha, 2016).

This was the case with the mythological explanations, gods begetting gods, and it will be the case with the natural philosophers before and after Parmenides. As a form of reasoning it is valid, but not always reliable.

- (1) The soul, the animating principle, causes movement.
- (2) Magnets and amber (when rubbed) cause movement.
- (3) Therefore magnets and amber have souls.

This fallacy, affirmation of the consequent, will appear again and again. (If A then B, B therefore A.) Since the intent is persuasion, the fact that the argument is invalid will not matter if it gets others to accept it.

Another consideration is that inferences of the sort,  $A \rightarrow B$ , are sometimes imagined to be  $A \equiv B$ . That is, if it is wet outside, it is raining is the same as if it is raining outside, it is wet. The everyday world is sometimes perceived as slightly different from what the use of logic would have us believe. If it is wet outside, then it is raining, and if it is raining outside, then it is wet.

This being the case, the affirmation of the consequent above becomes not a fallacy but a true (or at least, believable) statement about the world. It seems to have taken some time for the Greeks to recognise this.

#### 8.2.d All things are full of gods

Some say the soul is mixed in with the whole universe, and perhaps this is why Thales supposed that all things are full of gods (Aristotle, *On the Soul* 1.5 411a7-8 = DK 11A22).

This can be restated simply as, 'All things are full of gods because the soul is mixed in with the whole universe'.

Thales' sageworthiness should have meant he was at least listened to, if not believed. As important as his audience accepting his ideas on the basis of trust is what they thought after time to reflect. At this early stage his audience would be aware of two similar but different accounts of the world; the mythological and the physical (and perhaps their own). This would have caused them to process, evaluate and reach some sort of decision. With Thales, there was the choice of mythological versus physical. It seems the mythological held sway. As time wore on, there would have been a choice between the different physical accounts as well. Cognitive dissonance and the excluded middle would ensure this.

#### 8.2.e Other Thalean ideas

They say that Thales was the first to prove that a circle is bisected by its diameter (Proclus, *Commentary on Euclid* 157.10-11).

Thales is also known for some geometrical theorems. The records refer to him 'proving' or 'demonstrating' them (translations differ). This probably means something like 'pointing out' or practically explaining the principles. This would suggest something different from the later concept of a geometric proof – the writing of reasoned, logical explanations that use definitions, axioms, postulates, and previously proved theorems, arriving at a conclusion about a geometric statement. It would be closer to this definition of prove: to demonstrate the truth or existence of (something) by evidence or argument. With Thales, this could have been nothing more than cutting out a circle and folding it in half. In the same way he could have 'proved' the other geometrical theorems he is known for: the right triangle, which he applied to calculating the

heights of pyramids, and similar triangles, which he applied to calculating the distance of ships from the shore. The point is that this sort of ‘proving’ is a type of reason-giving, and could have been good practice for his other speculations (McKirahan, 1994, p.26).

### 8.3 Anaximander of Miletus (c.610-c.546)

Anaximander is sometimes described as the pupil of Thales. This is probably not accurate. More likely, they were members of a group or circle that discussed, among other things, the nature of the world. Thales may not have needed reasons to persuade while Anaximander did. Whichever was the case, there is a clear development in ATR-type reasoning with Anaximander.

Apollodorus of Athens . . . says in his *Chronicles* that [Anaximander] was sixty-three in the second year of the fifty-eighth Olympiad [547/6 BC] and that he died shortly after (Diogenes Laertius, *Lives of Eminent Philosophers*, II 2).

#### 8.3.a The *arché* is *apeiron*

Anaximander was the first to introduce the term ‘*arché*’ to refer specifically to principle and element of what is. This was the meaning that persisted.

Of those who declared that the *arché* is one, moving and *apeiron*, Anaximander . . . said that the *apeiron* was the *arché* and element of things that are, and he was the first to introduce this name for the *arché* [that is, he was the first to call the *arché* *apeiron*] (Simplicius, *Commentary on Aristotle’s Physics* 24.13–21 = DK 12A9 + 12B1).

Anaximander does not supply reasons for his *apeiron*, and while later writers have, they seem anachronistic. However, Anaximander may not have needed them. The idea that the *arché* is *apeiron*, once it had arisen, would only have needed reasons to support it if challenged. It may have been accepted on the basis of trust.

#### 8.3.b The *arché* cannot be water or any of the four elements

He says that the *arché* is neither water nor any of the other things called elements, but some nature which is *apeiron*, out of which come to be all the heavens and the worlds in them (Hippolytus, *Refutation of All Heresies* 1.6.1–2 = DK 12A11).

The fragment above may be in response to Thales’ water. Simplicius implies that Anaximander had reasons for not choosing one of the four elements as his *arché* but it is not stated:

It is clear that he observed the changes of the four elements into one another and resolved not to make any one of them the underlying stuff but rather something else apart from them (Simplicius, *Commentary on Aristotle’s Physics* 24.21–25 = DK 12A9).

If reasons were missing from presocratic fragments, later writers posited their own, which doesn't really help us. Aristotle proffers a well-developed counter argument against the *apeiron* being one of the four elements:

The infinite [*apeiron*] body cannot be one and simple . . . if it is conceived, as some say, as that which is aside from the elements, and from which they generate the elements. . . . For some make the infinite this [i.e., something aside from the elements], rather than air or water, to keep the others from being destroyed by the one of them that is infinite. For they contain oppositions with regard to one another, for example, air is cold, water wet, fire hot. If any one of them were infinite, the rest would already have been destroyed. But as it is, they declare that the thing from which all come into being is different (Aristotle, *Physics* 3.3 204b22-29 = DK 12A16).

The *apeiron* could be seen as Anaximander's response to the question, if everything is of or from water, why isn't everything wet? The *apeiron* therefore should have no definite characteristics.

### 8.3.c Things come to be by separation

He accounts for coming into being not by alteration of the element but by the separating off of the opposites by an eternal motion (Simplicius, *Commentary on Aristotle's Physics* 24.21-25 = DK 12A9).

In addition he said that motion is eternal, in which it occurs that the heavens come to be (Hippolytus, *Refutation of All Heresies* 1.6.1-2 = DK 12A11).

The changes from the original *apeiron* are the result of a separating off of opposites by an eternal motion which produces hot and cold. These act on one another and in turn generate the world. The form of the hot is fire, the origin of the sun, the moon and the stars. The form of the cold is a dark mist, which can be transformed into air and earth. These changes happen not by chance but according to necessity. This can be compared to Hesiod's *Theogony*. It is a non-mythological explanation of how the world came to be.

### 8.3.d The *apeiron* is divine

However, as we move away from the *arché*, we start to find reasons and arguments in Anaximander, some quite persuasive. In the following fragment is a clear reason:

This [the infinite, *apeiron*] does not have an *arché*, but this seems to be the *arché* of the rest, and to contain all things and steer all things, as all declare who do not fashion other causes aside from the infinite [the *apeiron*] . . . and this is the divine. For it is deathless and indestructible, as Anaximander and most of the natural philosophers say (Aristotle, *Physics* 3.4 203b10-15 = DK 12A15).



The claim is that the *apeiron* is divine. In response to the “Why?” question, it is easy enough to inference backwards to the argument:

- (1) Whatever is deathless and indestructible is divine. (These being the characteristics of ‘divine’.)
- (2) The *apeiron* is deathless and indestructible.
- (3) Therefore, the *apeiron* is divine.

There are things missing from this argument; for example, how do we know that the *apeiron* is deathless and indestructible? But, if these arguments were constructed with an expected audience in mind, this may have been all that was considered necessary. The response, if any, would dictate the next step.

### 8.3.e The earth stays at rest—principle of sufficient reason

The argument from probability was pointed out in the Hymn to Hermes. A second sort of argument, based on the principle of sufficient reason, appears with Anaximander and can be added to the toolbox.

For Anaximander, the earth is not floating on water but at rest in space. As McKirahan states: “Unusual is the sophisticated argument on which he bases [or, with which he supports (GA)] this belief” (McKirahan, 1994, p.40).

Some, like Anaximander . . . declare that the earth stays at rest because of equality. For it is no more fitting for what is situated at the centre and is equally far from the extremes to move up rather than down or sideways. And it is impossible for it to move in opposite directions at the same time. Therefore, it stays at rest of necessity (Aristotle, *On the Heavens* 2.13 295b11–16 = DK 12A26).

The earth is aloft and is not supported by anything. It stays at rest because its distance from all things is equal (Hippolytus, *Refutation of All Heresies* 1.6.3–4 = DK 12A11).

This must be the response to Thales’ idea of the earth floating on water: It is observed that the earth stays at rest. Why is this? According to Anaximander, it is because it is equal distance from all things and therefore there is no reason (“no more fitting”) for it to move in one direction over another. It stays at rest of (logical) necessity.

One way of expressing the argument is the modus tollens form, which arrives at a conclusion by negation. This is going to become a regular occurrence in the records and will become the basis of Zeno and Melissus’ arguments, or counter-arguments.

- (1) If there is sufficient reason for something to move, then it moves.
- (2) The earth doesn’t move.
- (3) Therefore, there is not sufficient reason for it to move.



The other way of expressing the argument is modus ponens.

“The earth stays at rest because of equality.” Or, “It stays at rest because its distance from all things is equal.”

In other words, “if equality → stays at rest”. There is an equality; therefore, stays at rest. Admittedly, the equality is only in terms of distance; but, it’s a start.

- (1) If something is of equal distance from all things, then it will stay at rest.
- (2) The earth is of equal distance from all things.
- (3) Therefore, the earth stays at rest.

In answer to the question, why does the earth stay at rest? Anaximander has inferred backwards to an interesting and persuasive argument. The process may have been something like: why doesn’t the earth move? Because it has no reason to move. Why doesn’t it have reason to move? Because if it moved it would have to move somewhere, and if it moved somewhere it would have to be because the reason to move to the ‘somewhere’ was greater than alternative reasons to move somewhere else. Why is that? Because all somewheres are of equal distance away. These may not be exactly the thoughts that ran through Anaximander’s mind, but it may be something like it.

What is more important, however, is that the argument he gives is the “first known application of the Principle of Sufficient Reason” (McKirahan, 1994, p.40), which, according to Leibniz, is that “no fact can be real or existent . . . unless it has a sufficient reason why it should be thus and not otherwise” (Leibniz, sec. 32). Anaximander implies that there is no reason for the earth to be moving in one direction as opposed to any other. Anaximander’s (deductive) argument would have been difficult to refute at the time as it was using ideas that were commonly accepted. It is a significant development.

### 8.3.f Other explanations

Anaximander speculated on a number of other topics, giving fairly convincing analogical explanations to support them. I will present two without comment; it is obvious what he is doing. I have underlined the words or phrases that indicate reasons.

He also declares that in the beginning humans were born from animals of a different kind, since other animals quickly manage on their own . . . (Pseudo-Plutarch, *Opinions* 2 = DK 12A10).

Winds occur when the finest vapours of dark mist are separated off and collect together and then are set in motion. Rain results from the vapour arising from the earth under the influence of the sun. Lightning occurs whenever wind escapes and splits the clouds apart (Hippolytus, *Refutation of All Heresies* 1.6.5-7 = DK 12A11).

## 8.4 Anaximenes of Miletus (c.585-525)

Anaximenes proposed *aer* as the *arché*. Replacing Anaximander's *apeiron* with something like mist. He proposed a mechanism for change that was more developed than Anaximander's vague separation. And, probably in response to a more discerning or demanding audience, he developed arguments for speculations in other areas, scoring a couple of firsts in a couple of areas – one being his more direct use of physical evidence to support his ideas of how things come to be and how things change.

### 8.4.a The *arché* is one and unlimited but not indeterminate

Anaximenes . . . like Anaximander, declares that the under-lying nature is one and unlimited [*apeiron*] . . . (Theophrastus, quoted by Simplicius, *Commentary on Aristotle's Physics* 24.26–25.1 = DK 13A5).

Anaximenes . . . declared that the principle is unlimited [*apeiron*] *aer*, from which come to be things that are coming to be, things that have come to be, and things that will be, and gods and divine things (Hippolytus, *Refutation of All Heresies* 1.7.1–8 = 13A7).

Anaximenes' *arché* is one and unlimited (*apeiron* = unlimited), as Anaximander held. There are no reasons given although a number have been proposed by later writers that are quite persuasive.

### 8.4.b The *arché* is *aer*

. . . the under-lying nature is one and unlimited [*apeiron*] but not indeterminate, as Anaximander held, but definite, saying that it is *aer* (air) (Theophrastus, quoted by Simplicius, *Commentary on Aristotle's Physics* 24.26–25.1 = DK 13A5).

. . . the principle is unlimited [*apeiron*] *aer* . . . The rest come to be out of the products of this (Hippolytus, *Refutation of All Heresies* 1.7.1–8 = 13A7)

Anaximenes the Milesian asserted that *aer* is the principle of the things which exist; for everything comes into being from air and is resolved again into it (Pseudo-Plutarch, *Opinions* 876AB = DK 13B2).

Anaximenes says that *aer*, something closer to mist than air, is the principle from which come to be the things that are. There are no specific reasons given for the choice of *aer*. However, it could be that his explanation of what it is that causes substances to be different and his proposed mechanism of change are his reasons.

#### 8.4.c Substances differ in rarity and density

The form of *aer* is the following: when it is most even, it is invisible, but it is revealed by the cold and the hot and the wet, and by its motion. It is always moving, for all the things that undergo change would not change if it were not moving. For when it becomes condensed or finer, it appears different. For when it is dissolved into a finer condition it becomes fire, and on the other hand air being condensed becomes winds (Hippolytus, *Refutation of All Heresies* 1.7.1-8 = 13A7).

It differs in rarity and density according to the substances <it becomes>. Becoming finer, it comes to be fire; being condensed, it comes to be wind, then cloud; and when still further condensed, it becomes water, then earth, then stones, and the rest come to be from these (Theophrastus, quoted by Simplicius, *Commentary on Aristotle's Physics* 24.26-25.1 = DK 13A5).

This is a complete explanation for how things come to be and how they change. It is not only because they vary in density but also because they are caused to vary in density. When *aer* is most even it is invisible. In a less dense state it presents as fire. In denser states it presents as wind, then cloud, water, earth, and stones. The differences that relate to air, water, clouds, and the like can be easily observed in the world – the three states of water.

#### 8.4.d Condensation and rarefaction cause change

It is eternal motion that causes changes from one state to another. In the following fragments, his explanation is made clear.

He too makes motion eternal and says that change also comes to be through it (Theophrastus, quoted by Simplicius, *Commentary on Aristotle's Physics* 24.26-25.1 = DK 13A5).

Anaximenes stated that clouds occur when the air is further thickened. When it is condensed still more, rain is squeezed out. Hail occurs when the falling water freezes, and snow when some wind is caught up in the moisture (Aëtius 3.4.1 = DK 13A17).

Cloud comes from air through felting, and water comes to be when this happens to a greater degree. When condensed still more it becomes earth, and when it reaches the absolutely densest stage it becomes stones. Thus the most important factors in coming into being are opposites – hot and cold (Hippolytus, *Refutation of All Heresies* 1.7.1-8 = 13A7).

This mechanism explains the different densities and hence the different things in the world. This explanation is very persuasive as it accounts for what can be readily observed in the world and it uses evidence from the world. In fact, it provides good reasons for accepting the idea that all is *aer*. Basically, if *aer* is squeezed it becomes denser and if somehow not-squeezed it becomes finer. It is the eternal motion that is the cause of this squeezing and unsqueezing.

#### 8.4.e Hot and the cold are caused by condensation and rarefaction

Another consequence of the squeezing and unsqueezing is the hot and the cold, which Anaximenes sets about proving empirically:

. . . let us leave neither the cold nor the hot in the category of substance, but <hold them to be> common attributes of matter, which come as the results of its changes. . . . As a result he claimed that it is not said unreasonably that a person releases both hot and cold from his mouth. For the breath becomes cold when compressed and condensed by the lips, and when the mouth is relaxed, the escaping breath becomes warm because of rareness (Plutarch, *The Principle of Cold* 7 947F = 13B1).

Anaximenes states that hot and cold are the result of change, not substances in themselves. More importantly, he has a demonstration to support his statement: air passing the lips causing two states – when condensed, cold, and when rarefied, hot. This is something that everyone can experience, and hence a more persuasive argument than just referring to perceptions.

McKirahan refers to the fragment above as “the first piece of reasoning preserved from Greek philosophy” (1994, p. 51). However, the evidence from the earlier texts and fragments suggests there was not a time when the Greeks were not reasoning. From a CTR perspective, it is imaginable that this fragment could be interpreted as the earliest example of ‘Greek rationalism’. A better interpretation may be that it is the best example yet of the use of observable/experienced phenomena as physical evidence supporting a particular idea.

#### 8.4.f *Aer* is a god

Anaximenes determined that air is a god and that it comes to be and is without measure, infinite, and always in motion (Cicero, *On the Nature of the Gods* 1.10.26 = DK 13A10).

Anaximenes’ reasons for the idea that *aer* is divine are similar to those of Anaximander (and, indirectly, Thales also), by referring to his/her/its qualities.

- (1) If something comes to be and is without measure, infinite, and always in motion, then it is a god (divine).
- (2) *Aer* comes to be and is without measure, infinite, and always in motion.
- (3) Therefore, *aer* is a god (divine).

He adds a couple more qualities, but the reason is basically the same. The idea that the *arché* is divine suggests that Milesian ideas at the time were not too different from existing mythological ideas. “All is gods” became “All is divine” or “All is god”. This should have allayed suspicion that the natural philosophers were engaged in unorthodox or heretical activities. So, while the argument above is not particularly noteworthy, perhaps it indicates an inclination to persuade others that there was no threat with these new ideas. What will need to be followed up is of course the idea of gods “coming to be”. Do they? This will be addressed by the next presocratic on the scene.

#### 8.4.g The earth is flat and floats on air

For Thales, the earth rested on water; for Anaximander, it was suspended in space as there was no reason for it to go one way or another. Anaximenes has another idea, it was flat and suspended over a column of air.

Anaximenes, Anaxagoras, and Democritus say that its flatness is the cause of its staying at rest. For it does not cut the air below but covers it like a lid, as bodies with flatness apparently do; they are difficult for winds to move because of their resistance. They say that the earth does this same thing with respect to the air beneath because of its flatness. And the air, lacking sufficient room to move aside, stays at rest in a mass because of the air beneath (Aristotle, *On the Heavens* 2.13 294b13–20 = DK 13A20).

This explanation uses analogy in a specific way. The explanation is first presented, followed by the evidence, making for a more persuasive argument. Lids floating on boiling pots would have been common, and connecting one representation with another can be quite persuasive. In fact, the image that that is caused to arise in the mind is persuasive enough without need for further reasons. It is wrong and therefore a next step would be better explanation, better evidence, or a different type of argument.

#### 8.4.h Earthquakes and the earth being drenched and drying

Anaximenes declares that when the earth is being drenched and dried out it bursts, and earthquakes result from these hills breaking off and collapsing. This is why earthquakes occur in droughts and also in heavy rains. For in the droughts, as was said, the earth is broken while being dried out, and when it becomes excessively wet from the waters, it falls apart (Aristotle, *Meteorology* 2.7 365b6–12 = DK 13A21).

Anaximenes' explanation refers to observables as supporting evidence. This use of easily observed physical phenomena as evidence, including that earthquakes occur in droughts and also in heavy rains, which was apparently what was actually happening in various parts of Greece at the time, is a significant development. One problem with referring to and basing ideas and arguments on observables is that they can be perceived differently by different people.

#### 8.4.i Anaximenes' use of analogy

Of final interest is Anaximenes' use of analogy in order to cause to arise in the mind clearer mental representations of what it is he is attempting to persuade others to accept. For example:

... the stars are implanted like nails in the 'ice-like'; but some say they are fiery leaves like paintings (Aetius II, 14, 3-4).

Anaximenes says the sun is flat like a leaf (Aetius II, 22,1).

Heavenly bodies do not move under the earth ... but round it, just like a felt cap turns round our head ... (Hippolytus, *Refutation of All Heresies* I, 7, 6).

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## 9.0 XENOPHANES OF COLOPHON (c.570-c.475)

In some ways, Xenophanes is the hero of the story. He consolidated what the Milesians were doing, raised questions of knowledge, refuted existing ideas, put forward his own ideas, and he did all this in a way that brought about some significant developments in reasoning. With Xenophanes, the implicit became explicit.

According to Kirk, Raven and Schofield, Xenophanes “was a poet and a sage, a singer of his own songs rather than those of others: he was certainly not, as some have mistakenly assumed . . . a Homeric rhapsode. In the longest of his extant elegies (B1, an interesting poem with no immediate philosophical relevance) he has authority enough to outline the rules of behaviour for the symposium that is to follow; he seems therefore to have been honourably received in aristocratic households” (Kirk, Raven and Schofield, 1983, p.164).

[Xenophanes] wrote in verse, both elegiac and iambic, against Hesiod and Homer, censuring them for their remarks about the gods. He also recited his own poems. He is said to have disagreed with Thales and with Pythagoras, and to have attacked Epimenides. He lived to an advanced age, as he himself says:

Already there are sixty-seven years  
tossing my speculation throughout the land of Greece,  
and from my birth there were twenty-five in addition to these, if indeed I know how to  
speak truly about these matters (Diogenes Laertius, *Lives of the Philosophers* 9.18-19 =  
DK 21B8).

The natural domain of arguments is actions, explaining and justifying them. It appears that Xenophanes is consciously and deliberately devising them and that he applies his ‘way’ to other areas of interest. I will introduce some preliminary ideas before discussing his *arché*.

### 9.1 We should express thoughts that are noble

Xenophanes’ fragments are the first to provide clear reasons that could be considered his own (that is, not put into his mouth by later writers) for ideas or claims. This is especially true of the fragment referred to by Kirk, Raven and Schofield above, which, while usually dismissed by serious philosophers,<sup>19</sup> actually gives a great deal of information relevant to our purposes. I present the fragment first and then comment:

For now, behold, the floor is clean, and so too the hands of all, and the cups. One (attendant) places woven garlands round our heads, another proffers sweet-scented myrrh in a saucer. The mixing-bowl stands there full of good cheer, and another wine is ready in the jar, a wine that promises never to betray us, honeyed, smelling of flowers. In our midst the frankincense gives forth its sacred perfume; and there is cold water, sweet and pure. Golden loaves lie to hand, and the lordly table is laden with cheese and with honey. The altar in the centre is

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<sup>19</sup> “an interesting poem with no immediate philosophical relevance” (Kirk, Raven and Schofield, 1983, p.164)

decked with flowers all over, and song and revelry fill the mansion.

It is proper for men who are enjoying themselves first of all to praise God with decent stories and pure words. But when they have poured a libation and prayed for the power to do what is just – for thus to pray is our foremost need – it is no outrage to drink as much as will enable you to reach home without a guide, unless you are very old. But the man whom one must praise is he who after drinking expresses thoughts that are noble, as well as his memory (and his endeavour) concerning virtue allows, not treating of the battles of the Titans or of the Giants, figments of our predecessors, nor of violent civil war, in which tales there is nothing useful; but always to have respect for the gods, *that is good* (Athenaeus, *Scholars at Dinner* 11.462c = DK 21B1).

The custom of drinking parties, or symposia, began in the 7<sup>th</sup> century. Xenophanes (in the 6<sup>th</sup> century), like most Greek males of a certain class, was aware of what went on in them; he would have provided or been some of the entertainment. As Kirk, Raven and Schofield imply, these were held by aristocratic households, at the least, and they followed a set procedure. At a set time, after the drinking, participants had the chance to prove themselves praiseworthy and so gain a reputation for being *sophos*, which they did by “expressing thoughts that are noble”. A slightly different translation conveys the same sentiment:

Praise the man who after drinking behaves nobly in that he possesses memory and aims for excellence (*aretē*) and relates neither battles of Titans nor Giants nor Centaurs – the fictions of our fathers . . . (Trans: Curd and McKirahan, 2011, p.32).

After the drinking came the chance to demonstrate noble behaviour, which, in this case, seems to have meant speeches of some sort – perhaps speeches that demonstrate learning or even wisdom, not the “figments of our predecessors” or “fictions of our fathers”. The argument that Xenophanes seems to be making is that if a person speaks nobly then they are acting or “behaving nobly”. And, for acting nobly they should be praised, which, of course, will contribute to their reputation. We are told what not to do: repeat the old stories of gods and heroes and strife, but not what to do. However, the fragment B2 gives a hint.

## 9.2 I should be rewarded and maintained by the *polis*

The following fragment (B2) gives one example of what Xenophanes is referring to as “thoughts that are noble”: two conclusions along with his reasons or arguments, clearly aimed at persuasion. Similar forms of argument can be found in Homer and Hesiod, with the example from the *Iliad* earlier, so Xenophanes was not doing anything new, in one respect. However, the way he has consciously and deliberately devised arguments and presented them in written form provides an early template for justificatory reasons. The fact that it is written would have allowed others to read, reflect, refine and respond.

But if anyone were to win a victory with fleetness of foot, or fighting in the Pentathlon, where the precinct of Zeus lies between the springs of Pisa at Olympia, or in wrestling, or in virtue of the painful science of boxing, or in a dread kind of contest called Pankration: to the citizens he would be more glorious to look upon, and he would acquire a conspicuous seat of



honour at competitions, and his maintenance would be provided out of the public stores by the *Polis*, as well as a gift for him to lay aside as treasure.

So too if he won a prize with his horses, he would obtain all these rewards, though not deserving of them as *I* am; for my craft (wisdom) is better than the strength of men or of horses. Yet opinion is altogether confused in this matter, and it is not right to prefer physical strength to noble Wisdom. For it is not the presence of a good boxer in the community, nor of one good at the Pentathlon or at wrestling, nor even of one who excels in fleetness of foot – which is the highest in honour of all the feats of strength seen in men’s athletic contests – it is not these that will give a *Polis* a better constitution. Small would be the enjoyment that a *Polis* would reap over the athletic victory of a citizen beside the banks of Pisa! These things do not enrich the treasure chambers of the *Polis* (Athenaeus, *Scholars at Dinner* 10.413f = DK 21B2).

He would probably have found an initial agreement from his audience if he began with an opening statement like:

“Some things enrich the treasure chambers of the *polis* and other things don’t.”

It would follow, therefore, that those things that enrich the treasure chambers deserve to be rewarded and those things that don’t do not deserve to be rewarded.

By ‘things’ he is referring to actions carried out by people – the citizens of the *polis*.

Recycling his own words, his argument becomes:

- (1) What enriches the treasure chambers of the *polis* deserves to be rewarded.
- (2) I enrich the treasure chambers of the *polis* with my craft (wisdom).
- (3) Therefore, I deserve to be rewarded.

And the counter argument becomes:

- (1) What doesn’t enrich the treasure chambers of the *polis* does not deserve to be rewarded.
- (2) The winners of sports competitions and the like do not enrich the treasure chambers of the *polis*.
- (3) Therefore, they do not deserve to be rewarded.

Xenophanes must be aware of what he was doing and after many years of performing at symposia and the like he would have had ample time to reflect on and refine his arguments. What is important about this fragment is that it is the best example to date of what most would agree is a consciously and deliberately constructed argument.

### 9.3 The gods do not live moral and orderly lives

Give us no fights with Titans, no, nor giants  
nor Centaurs – the forgeries of our fathers –  
nor civil brawls, in which no advantage is.

But always to be mindful of the gods is good (Athenaeus, *Scholars at Dinner* 11.462c = DK 21B1).

Homer and Hesiod have ascribed to the gods all deeds which among men are a reproach and a disgrace: thieving, adultery, and deceiving one another (Sextus Empiricus, *Against the Mathematicians* 9.193 = DK 21B11).

In these two fragments, Xenophanes argues that the gods do not live moral and orderly lives, and in doing this he refutes a widely held belief.

- (1) If anyone engages in thievery, adultery, and deceiving one another, they are a reproach and a disgrace.
- (2) The gods do engage in thievery, adultery, and deceiving one another (as Homer and Hesiod say).
- (3) Therefore, the gods are a reproach and a disgrace.

Any of the following four statements could have been used in his argument:

- A. If someone does X, Y and Z, then they are moral.
- B. If someone is moral, then they do X, Y and Z.
- C. If someone is immoral, then they do A, B, and C.
- D. If someone does A, B, and C, then they are immoral.

Therefore, on the basis of A. and B., (1) being moral = doing X, Y and Z. And, on the basis of C. and D., (2) being immoral = doing A, B, and C.

If we choose to use the first equation, we can use either inference A or B above. Xenophanes' may have based his counter argument on applying modus tollens to B.

- (1) If someone is moral, then they do X, Y, and Z.
- (2) The gods don't do X, Y and Z. (In fact, they do the opposite of X, Y and Z.)
- (3) Therefore, the gods aren't moral.

If we choose the second equation, we can use either inference C. or D. above. Xenophanes has used D.

- (1) If someone does A, B, and C, then they are immoral.
- (2) The gods do A, B, and C. (Thievery, adultery, and deceiving one another.)
- (3) Therefore, the gods are immoral.

The conclusions are the same but the reasons/arguments differ. Which is the stronger, more persuasive argument? It would be difficult to say as it would depend on the audience. The first might be safer as it doesn't accuse the gods of doing wrong; only of not doing right. But this is not how the fragments read. This perhaps indicates a certain confidence in expressing unorthodox

ideas about the gods and suggests the social and cultural context of the time, at least with respect to Xenophanes' small band of reflectors (his audience).

Although it doesn't appear in the fragment, perhaps because it was a little 'risky', a further argument could be made that we should only emulate those who are worthy of emulation. The gods are not worthy of emulation; therefore, the gods should not be emulated. However, while this is not stated explicitly, it is something Xenophanes could have thought and could have spoken about in a symposium at the appropriate time and place.

#### 9.4 Our ideas of the gods are wrong

Mortals believe that the gods are born  
and have human clothing, voice and form (Clement, *Miscellanies* 5.109 = DK 21B14).

Ethiopians say that their gods are flat-nosed and dark,  
Thracians that theirs are blue-eyed and red-haired (Clement, *Miscellanies* 7.22 = DK 21B16).

If oxen and horses and lions had hands  
and were able to draw with their hands and do the same things as men,  
horses would draw the shapes of gods to look like horses  
and oxen to look like oxen, and each would make the  
gods' bodies have the same shapes as they themselves had. (Clement, *Miscellanies* 5.110 = DK 21B15).

The fragments above continue Xenophanes' refutations of existing ideas. Not only are we wrong if we think the gods behave well, we are also wrong if we think they resemble us in any way: "are born, have human clothing, voice and form".

Greeks think their gods look and behave like Greeks. Other people think likewise for their gods. And, if animals could, they would describe their gods as resembling themselves. It is not possible for a god to simultaneously have the characteristics of all people (and animals) and it is not possible to decide which version, if any, is correct, and so the idea of anthropomorphic gods should be set aside. This argument is based on application of a principle, and as such is persuasive. The principle is that if we have three different descriptions, A, B and C, and if there is not sufficient reason for preferring one over the others, then all are questionable.

If all accounts of gods are questionable, could Xenophanes propose any alternative accounts with better chances of being accepted? This is exactly what he did.

#### 9.5 There is a one god, but he (she/it) is not like us

The following is an A fragment and therefore not fully reliable. It may be a Xenophanean idea but the reason could have been supplied later.

Xenophanes used to say that those who say that the gods are born are just as impious as those who say that they die, since in both ways it follows that there is a time when the gods do not exist (Aristotle, *Rhetoric* 2.23 1399b6–9 = DK 21A12).

Being born means to come into being: coming into being from a state of not-being. Dying means to change into a state of not-being. In both cases, it is implied that there is a time of not existing; before being born in one case and after dying in the other. In Xenophanes' time it was impious to deny the Olympian's immortality. This fragment is a good example of Xenophanes' use of existing ideas to refute.

If we look at one more A fragment and the relevant B fragments concerning Xenophanes' One-and-All (see below), his God, the ideas are missing explicit reasons.

It is unholy for any of the gods to have a master (pseudo-Plutarch, *Stromata* 4 = DK 21A32).

... always [he] remains in the same [state], changing not at all,  
nor is it fitting that [he] come and go to different places at different times (Simplicius,  
*Commentary on Aristotle's Physics* 23.10 = DK 21B26).

One god, greatest among gods and men, not at all like mortals in form or thought (Clement,  
*Miscellanies*, 5.109 = DK 21B23).

... whole [he] sees, whole [he] thinks, and whole [he] hears (Sextus Empiricus, *Against the Mathematicians* 9.144 = DK 21B24).

... but completely without toil [he] agitates all things by the will of his mind (Simplicius,  
*Commentary on Aristotle's Physics* 23.19 = DK 21B25).

These fragments may have had reasons accompanying them or may have served as reasons originally. Later writers have used them in positing possible reasons for Xenophanes' ideas, some seem likely but others come across as anachronistic.

## 9.6 Iris the rainbow is a cloud

Xenophanes is important for his demythologising and his physical explanations based on observable evidence. There is persuasive power in being able to explain how something is or came to be, and the causal chain can be recycled as reasons. Iris the rainbow is now a physical phenomenon:

She whom they call Iris, this too is by nature cloud: purple, and red, and greeny-yellow to behold (Scholium BLT on *Iliad* 11.27 = DK 21B32).

If this incomplete physical explanation is accepted, then one question has been answered: what is a rainbow, but one remains: why should I accept your idea that it is a coloured cloud?

## 9.7 Xenophanes' *arché* is the one god

Aristotle states that Xenophanes did not have a clear conception of an *arché* and that “an account of his views belongs to a different inquiry from the study of nature”. For Xenophanes “said that this ‘One-and-All’ is god” or “the one is god”.

Theophrastus says that Xenophanes of Colophon, the teacher of Parmenides, supposed that there is one principle, or that what exists is one and all, and neither limited nor limitless, neither moving nor motionless. He agrees that an account of his views belongs to a different inquiry from the study of nature; for Xenophanes said that this ‘one and all’ is god (Simplicius, *Commentary on the Physics* 22.26-23.20).

No reasons are recorded for Xenophanes' ideas of the *arché*: that there is one principle, that it is one and all, and that it is god. It seems that there was not universal agreement on what his *arché* was. In this case, reasons would have helped fill out the picture.

## 9.8 Xenophanes' *arché* is earth and water

Some writers have suggested that Xenophanes' *arché* was earth and water. Again, there are no reasons recorded, and the reason may be that his idea was the result of some problems in translation:

All things that come into being and grow are earth and water (John Philoponus, *Commentary on Aristotle's Physics* 1.5.125 = DK 21B29).

For all things are from the earth and all return to the earth in the end (Theodoretus, *Treatment of Greek Conditions* 4.5 = DK 21B27).

We all come into being out of earth and water (Sextus Empiricus, *Against the Mathematicians* 10.314 = DK 21B33).

“All things that come into being and grow” refers to all living things, not all things. Plants and animals come to be from earth and water. “There is a clear distinction between those perishable things “which take birth and grow”, the organisms, and what has no origin and is imperishable: the sea of air, the ocean, the earth ...” (Cleve, 1965, p.15-17).

On this basis, it seems that Xenophanes either did not propose a clear *arché* or because no supporting reasons are recorded it appears as only an idea with little to justify it. He did, however, refute Anaximenes' *aer*.

## 9.9 The *arché* is not Anaximenes' *aer*

Sea is the source of water and the source of wind. For not without the wide sea would there come to be in clouds the force of wind blowing out from within, nor streams of rivers nor rain water from the sky, but the great wide sea is the sire of clouds and winds and rivers (Geneva Scholium on *Iliad* 21.196 = DK 21B30).

Xenophanes gives a causal chain; if A causes B, then B cannot in turn cause A.

- (1) The great ocean is the source of the things that come to be that Anaximander mentions.
- (2) Two of the things that come to be from the great ocean are water and wind.
- (3) Therefore, since wind (*aer*) is from the source it cannot simultaneously be the source (*arché*).

If I have interpreted this argument accurately, it is a nice use of *reductio ad absurdum*, and somewhat earlier than Zeno.

## 9.10 The earth changes over time

In an A fragment is presented a well-developed theory:

He declared that the sea is salty because many mixtures flow together in it. . . . Xenophanes believes that earth is being mixed into the sea and over time it is dissolved by the moisture, saying that he has the following kinds of proofs: sea shells are found in the middle of earth and in mountains, and imprints of fish and seals have been found at Syracuse in the quarries, and the imprint of coral [or, "of a laurel leaf"] in the depth of the stone in Paros, and on Malta flat impressions of all forms of marine life. He says that these came about when all things were covered with mud long ago and the impressions were dried in the mud. All humans perish when the earth is carried down into the sea and becomes mud, and then there is another beginning of generation, and this change occurs in all the *kosmoi* [that is, in every such cycle] (Hippolytus, *Refutation of All Heresies* 1.14.3–6 = DK 21A33).

McKirahan states, the "importance of this passage lies more in its reasoning and use of evidence than in the doctrine it records. Particularly impressive is Xenophanes' marshalling of facts to support his thesis, which indicates a belief that the best way to prove a theory is to provide the greatest amount and widest variety of evidence possible" (McKirahan, 1994, p.66). Here again is another first for Xenophanes. This could be considered the beginning of the scientific method, a falsifiable hypothesis. It also indicates a more direct reference to and use of evidence than the Milesians; a stronger type of explanation used as a reason.

## 9.11 We may know but we can't know whether what we know is true

Xenophanes was “the first to reflect on the frailty of our ability to gain knowledge, Xenophanes is the father of epistemology. He was also hailed in antiquity as the father of scepticism ...” (McKirahan, 1994, p. 66).

No man has seen nor will anyone know  
the truth about the gods and all the things I speak of.  
For even if a person should in fact say what is absolutely the case,  
Nevertheless he himself does not know, but belief is fashioned over all things [or, in the case  
of all persons] (Sextus Empiricus, *Against the Mathematicians* 7.49.110 = DK 21B34).

Let these things be believed as resembling the truth (Plutarch, *Table Talk* 9.7.746b = DK 21B35).

By no means did the gods intimate all things to mortals from the beginning,  
but in time, inquiring, they discover better (Stobaeus, *Selections* 1.8.2 = DK 21B18).

These three fragments may be the result of some reflection on Milesian ideas and reasons. If ideas about the world arise from observations about the world, and if observations about the world depend on perspective, then as perspectives change ideas will change. The solution could be better, wider perspectives or better use of what is perceived. Xenophanes' use of the fossils as evidence (above) indicates a more direct, less speculative use of evidence. It also gives ideas that can be tested, which would have been difficult to do with earlier ideas about the *arché*. However, it leads to 'smaller' ideas than the all-encompassing ideas about the *arché*. Perhaps this was the way to go.

## 9.13 Heraclitus of Ephesus (c.535-c.475)

In moving forward, Heraclitus will be ignored. Although he has a number of ideas, he rarely gives reasons for them in a way that would persuade others to accept them, or in a way that adds to our investigation. Socrates' comment is indicative:

And they say that Euripides gave [Socrates] a small work of Heraclitus to read, and asked him afterwards what he thought of it, and he replied: 'The part I understand is excellent, and so too is, I dare say, the part I do not understand; but it needs a Delian diver to get to the bottom of it' (Diogenes Laertius, *Lives of the Philosophers* 2.22).

There is little benefit in speculating on his reasons if he did not give them originally. For one reason or other, his ideas have persisted.

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## 10. PARMENIDES OF ELEA (c.515-c.450)

If reasoning, as we claim, evolved to change others' minds, shouldn't it look for ... well-crafted arguments? (Sperber and Mercier, 2017, p.223)

Parmenides is an important figure for many reasons. In the traditional account he is considered a 'watershed' as the first fully rational Greek thinker. In his argument he proceeds deductively from two starting premises to the conclusion that All is One. The process he worked through is then presented as his proof. From this arose the idea that it is possible to discover the world through ratiocination; or at least, this is how it is sometimes interpreted. The text is consistent with both CTR and ATR interpretations. The ATR version that follows, Parmenides is equally important but for slightly different reasons. Instead of starting with immediate premises and working towards a conclusion that wasn't held in some form or other or known previously, the ATR interpretation is that he started with the intuitive idea that All is One and then proceeded to develop a proof in order to persuade others. His proof in the form of a sound deductive argument was the first that could be compared with Aristotle's definition of a 'demonstration'. Aristotle rejected Parmenides' idea on the basis that it contradicted his experience, and then confabulated a not entirely successful refutation accordingly:

. . . but, obviously, to think in this way in real life verges on insanity (Aristotle, *On Generation and Corruption* I 8. 325a13 = 28A25).

For Aristotle the soundness of an argument guarantees knowledge. From the ATR perspective, as Mercier states in an unpublished source, "a true conclusion is more likely to be supported by good arguments" (and therefore, accepted).<sup>20</sup> Are good arguments sound arguments? Aristotle would probably agree that the best argument is the soundest argument (the demonstration). Sperber and Mercier would probably argue that the best argument is the one that is most persuasive or the most difficult to refute (which may not necessarily be the same). And, the one that is the most difficult to refute is the sound argument. Reasons before Parmenides, as we have seen, are a mixture of explanations and arguments. After Parmenides, there is more of a focus on argument. Melissus re-wrote Parmenides' argument in a clearer and more formal way, and Zeno added the *elenchus* and together these led to significant developments in reasoning in Greece.

Parmenides believed that All is One, unmoving, unchanging, timeless and placeless. The CTR approach would argue that he arrived at this conclusion through a series of deductions, starting with the premise, "There is no not-being". The ATR approach would be that the belief arose intuitively and that Parmenides inferred backwardly to reasons to prove it, in this case, a deductive argument. While arguments can be confabricated for Xenophanes' ideas from his fragments, there is no need to do this with Parmenides. He lays out his arguments clearly and explicitly (despite his poetic form).

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<sup>20</sup> Mercier, <https://sites.google.com/site/hugomercier/theargumentativetheoryofreasoning>, accessed 12/2/17



## 10.1 All is One

Parmenides' arguments are "good arguments" and therefore his conclusion is more likely to be true. He constructed the most persuasive form of argument – the deduction – and in doing so, raised the bar for those who followed. Moreover, he challenged them to "judge by reason (*logos*) the heavily contested refutation (*elenchos*) spoken by me" (Sextus Empiricus, *Against the Mathematicians* 7.114 = DK 28B7). In other words, he seems to be saying, these are the strongest reasons I can devise to support my claims. If you want to disagree, you need to evaluate my reasons (my account = *logos*) and not just my ideas. (I have generalised a little; in the poem this challenge refers to just one particular argument, below, but the intention is clear.)

In presenting Parmenides' arguments, I am relying on Cleve (1965), who has done most of the work already, separating the arguments from the chaff. The problem for Parmenides would have been where to start. He was certain of where he wanted to finish, his beliefs about what-is. The two considerations for a good starting point, an opening premise, are whether it will be accepted by an audience and whether it will lead to the conclusion. If the opening premise will lead to the conclusion but isn't immediately accepted, something more needs to be done. His chosen premise, "being is" did lead to his conclusion, through the related premise "not-being is not", which, in the form 'nothing from nothing' was already accepted in Greece: "the common Hellenic view that nothing originates from nothing, and nothing turns into nothing" (Cleve 1965 p.24). But, he had some work to do to persuade his audience to accept it.

In the Proem, a goddess tells Parmenides that

. . . There is need for you to learn all things –  
both the unshaken heart of persuasive [or, well-rounded] Truth  
and the opinions of mortals, in which there is no true reliance (Simplicius, *Commentary on Aristotle's On the Heavens*, 557.25 = DK 28B1).

Which have become known as the Way of Truth and the Way of Opinion. In the next fragment, Parmenides lays out his basic argument:

Come now, I will tell you – and bring away my story safely when you have heard it –  
the only ways of inquiry there are to think:  
the one, that it is and that it is not possible for it not to be,  
is the path of Persuasion (for it attends up on Truth),  
the other, that it is not and that it is necessary for it not to be,  
this I point out to you to be a path completely unlearnable,  
for neither may you know that which is not (for it is not the be accomplished)  
nor may you declare it (Proclus, *Commentary on Plato's Timaeus* 1.345.18 and Simplicius,  
*Commentary on Aristotle's Physics* 116.28 = DK 28B2

According to Cleve (1965, p.527-532), "Parmenides' philosophy proper begins with an existential sentence without a subject, [the first underlining in the fragment above]:

There is.  
ἔστιν

Fr. 2, 3.

Then follows, in the same line, [the second underlining in the fragment above] a second existential sentence:

There is no not-being.  
οὐκ ἔστι μὴ εἶναι

ibid.

(From Cleve: continues below)

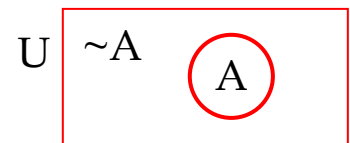
## 10.2 Arguing by analogy and using set theory: there is no not-being

On table T there is an apple, A.

If we consider T to be all there is, it becomes the universal set, U.

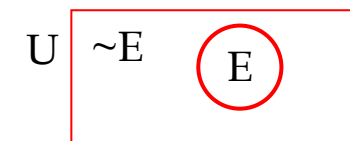
This means the universal set consists of the apple: A and everything else that is not the apple:  $\sim A$ .

$$A \ \& \ \sim A = U$$



For an apple to come to be, it must come to be from what it is not:  $\sim A$ , logically.

For an apple to pass away, it must pass away to what it is not:  $\sim A$ , logically.



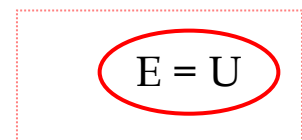
In the 'real' world, these changes can be observed, over time: an apple coming to be and an apple passing away, transforming one into the other. Or, more precisely, transforming from  $\sim A$  into A, and from A into  $\sim A$ .

If in the second diagram we change the "A" to "E" to signify 'esti' or 'exist', we now get a universal set that consists of E and all the rest,  $\sim E$ . That is, what is and what is-not.  $E \ \& \ \sim E = U$



But, in the third diagram, there is no not-being (from above) and so  $\sim E$  is not; there is no 'all the rest'.

In the fourth diagram, we are now left with what is (E) and this is equivalent to the universal set (U).



Parmenides states this explicitly:

- (c) There is.  $E \rightarrow E$  or, (E)  
(d) There is no not-being.  $\sim E \rightarrow \sim E$  or,  $\sim(\sim E)$

(From Cleve: continues)

The analogy of the two sentences shows that the grammatical subject of that first sentence is εἶναι (*einai*), or “to be”, “being”, just as the grammatical subject of the second sentence is μὴ εἶναι (*me einai*), or “not to be”, “not-being”. Consequently, the brachylogical first sentence, when given its complete form, means:

There is being.  
ἔστιν εἶναι

This alone is highly characteristic. Parmenides does not start, say, with the necessity of a belief in only one god or something about the origin of the world or so. He begins, instead, with certain propositions that could be validly stated even if there were no world at all.

Parmenides, namely, is a deducing philosopher, the first “rationalist” of antiquity. “He is the first philosopher to argue, formally deducing conclusions from premises, instead of making dogmatic announcements: (Cornford, 1939, p. 29).

*An Ancient ‘Cogito, ergo sum’*

Accordingly, the sentence, “There is being”, is then substantiated [in fragment 3]. This substantiation amounts to something like an ancient *cogito, ergo sum*:

Thinking = Being  
... το γὰρ αὐτὸ νοεῖν ἐστὶν τε καὶ εἶναι  
(literally: “For thinking and being is the same.”)

Just as any equation, also this one can be transformed into two sentences with copula construction:

Any thinking is being,  
any being is thinking.

The second of these proposition is rather objectionable, though. But we do not need it. The first proposition, however, when used as the major premise of a syllogism, leads to this result:

- (1) Any thinking is being.
- (2) There is thinking.
- (3) There is being.

The basic idea is, then: "Being is". This is evident from the outset. It is, so to speak, an *a priori* valid proposition."

We are left with "Being is, not-being is not". The idea that "Being is not and not-being is" is a "path completely unlearnable, for neither may you know that which is not (for it is not to be accomplished), nor may you declare it"."

(From Cleve: end of quotation)

In fragment 8 Parmenides bases the bulk of his arguments on the proposition "there is no not-being". I have only laid out some of the relevant sections to give a feeling for what Parmenides did. It is obvious that the poetic form makes things difficult.

. . . that what-is is ungenerated and imperishable,  
a whole of a single kind, unshaken, and complete.

Nor was it ever, nor will it be, since it is now, all together one, holding together:

For what birth will you seek out for it?

How and from what did it grow?

From what-is-not I will allow you neither to say nor to think:

For it is not to be said or thought that it is not.

What need would have roused it,

later or earlier, having begun from nothing, to grow?

In this way it is right either fully to be or not.

Nor will the force of true conviction ever permit anything to come to be  
beside it from what-is-not.

. . .

But how can what-is be hereafter? How can it come to be?

For if it came to be, it is not, not even if it is sometime going to be.

Thus coming-to-be has been extinguished and perishing cannot be investigated.

Nor is it divisible, since it is all alike,

. . .

But unchanging in the limits of great bonds

it is without starting or ceasing, since coming-to-be and perishing

have wandered very far away; and true trust drove them away.

Remaining the same and in the same and by itself it lies

and so remains there fixed . . . (Simplicius, *Commentary on Aristotle's Physics* 145.1– 146.25  
[lines 1–52]; 39.1–9 [lines 50–61] = DK 28B8).

Returning to Cleve, from "there is no not-being" the following arguments can be constructed:

- (1) There is no not-being.
- (2) Becoming is an initial not-being.
- (3) There is no becoming.

Fr. 8, 40

- (1) Not-being is not.
- (2) Perishing is a final not-being.
- (3) Perishing is not. Fr. 8, 40

- (1) Not-being is not.
- (2) Changing of place is an initial there not-being.
- (3) Changing of place is not. Fr. 8, 41

- (1) Not-being is not.
- (2) Having been is a now not-being.
- (3) Having been is not. Fr. 8, 5

- (1) Not-being is not.
- (2) Future being is a now not-being.
- (3) Future being is not. Fr. 8, 5

As there is no past and no future, it follows that being has neither a beginning nor an end in time. For the one would have to be in the past and the other in the future:

But, unmoved within the limits of big chains, it is there, without beginning and without an end. (Fr. 8, 26)

### 10.3 Thinking is being

Parmenides repeats his claim that thinking is being three times, which suggests he thought it an important point. These fragments are sometimes interpreted as the idea of something being thought matches the actual thing. I.e., what we think is what there is. And this is often refuted by a counter argument along the lines of – we can think of a unicorn but it doesn't mean they exist. This is a sort of dualism, contrary to Parmenides' claim that All is One.

It may be that he was arguing that the thought and the thing the thought is of are one and the same. That is, what is thought and spoken is what is; not that the two match but that there is only the one, the thought/thing. (This could be called idealism or non-dualism but as Parmenides' intention does not come through clearly, it might be best not to label it.) What is important to remember is that in Parmenides' time the concept of the insubstantial had not yet arisen. The thought of what-is and what-actually-is were both substantial, and as in accordance with Parmenides' other arguments, were both of the one substance, whatever it was. The three relevant fragments are

... For the same thing is [or, is there] for thinking and for being. [or, For thinking and being are the same.] (DK 28B3)

That which is there to be spoken and thought of must be. For it is possible for it to be, but not possible for nothing to be (DK 28B6).

Thinking and the thought that it is are the same. For not without what is, in which it is expressed, will you find thinking; for nothing else either is or will be except that which is . . . (DK 28B8 & 28B34).

28B3 has the equation Thinking = Being. This can be expressed as, if thinking then being and if being then thinking. This is repeated in 28B8. So we have the inferences (B = Being and T = Thinking):

$T \rightarrow B$ , and  $B \rightarrow T$ .

If something can be thought then it is. And, if something is, then it can be thought.

Applying *modus tollens* to the two inferences above, we get:

$\sim B \rightarrow \sim T$ , and  $\sim T \rightarrow \sim B$ .

If something is-not, then it cannot be thought. And, if something cannot be thought, then it is-not.

28B6 continues the idea by stating that what can be (spoken and) thought must be because X. And, the X is provided by the *modus tollens* above.

$(\sim B \rightarrow \sim T) \rightarrow ((B \rightarrow T) \& (\sim B \rightarrow \sim T))$

If something exists it can be thought, but if it doesn't exist it cannot be thought because no one can think what is-not. It is not possible.

I am not suggesting that Parmenides followed the process above; after all, it is based on symbols and logic. But, he did basically reach the same conclusion, which is that thinking and being are the same. That is, whatever I am thinking at this moment is what-is, by virtue of my thinking it. Since this can be experienced, even if the experience is illusory, it makes sense that in order to persuade others good reasons would be needed.

Getting back to the series of arguments Parmenides used to support his belief that All is One, without change or motion, without time, uniform and necessary. This was what he called the Way of Truth. In fragment 28B6, as well as the Thinking = Being argument, Parmenides adds a third Way to the two initially introduced in fragment 28B2:

That which is there to be spoken and thought must be.  
For it is possible for it to be,  
but not possible for nothing to be. I bid you consider this.  
For I bar your way from this first way of inquiry,  
but next from the way on which mortals, knowing nothing,  
two-headed, wander. For helplessness

in their breasts guides their wandering mind. But they are carried on equally deaf and blind, amazed, hordes without judgement, for whom both to be and not to be are judged the same and not the same, and the path of all is backward-turning (Simplicius, *Commentary on Aristotle's Physics* 86.27–28; 117.4–13 = DK 28B6).

#### 10.4 The third way is not to be taken

This third Way is the Way of What-is and What-is-not. Presumably, this is the way of those who imagine change and movement, and such like. Change being what-was-not becoming what-is. This fragment, in a way, adds to Xenophanes' questions and thoughts about knowledge and what can be known.

In the final third of his Poem, Parmenides discusses the world from the perspective of those who, two-headed, wander around thinking both what-is and what-is-not exist. This also adds to something that Xenophanes began, with his more physical explanations of what is observed in the world.

#### 10.5 Judge by reason the refutation / *elenchos* spoken by me.

Finally, Parmenides offers his challenge to those who would follow him:

For in no way may this prevail, that things that are not, are.  
But you, bar your thought from this way of inquiry,  
and do not let habit born from much experience compel you along this way  
to direct your sightless eye and sounding ear and tongue,  
but judge by reason (*logos*) the heavily contested refutation (*elenchos*) spoken by me (Plato, *Sophist* 242a; Sextus Empiricus, *Against the Mathematicians* 7.114 = DK 28B7).

Parmenides has refuted the idea that things that are-not are and recommends that this path be not taken. Besides the sound advice, this fragment is important for several other reasons. Firstly, he refers to reason explicitly; in this case, *logos* could also be translated as 'account', and challenges others to judge what he has done on the basis of reason and nothing else. For example, not on observations and feelings of or about the world. Secondly, he refers to his refutation, indicating he is fully aware of what he had done and how he had done it. The Greek word, *elenchos* (or later, *elenchus*) was later to become famous as Socrates' *modus operandi*.

In this fragment, Parmenides is giving us the clearest expression yet of the ATR explanation of reasoning. He has stated his belief that All is One and supported it with his arguments. He has taken the commonly accepted belief of what-is and what-is-not and refuted it. And he has challenged others to focus on and evaluate his arguments. If they cannot, in turn, refute them, they will need to accept them, in theory.

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## 11.0 THE ELEATICS

### 11.1 Introduction

Together Parmenides, Zeno and Melissus are labelled 'the Eleatics' (after Elea in southern Italy), even though Melissus may never have met the other two. Xenophanes is sometimes considered the founder or the instigator on the basis of certain similarities. The Eleatics influenced reasoning in several ways. Firstly, of course, is Parmenides' argument, which introduced the idea of deductive proof. There are earlier examples, such as those mentioned above in Homer, which indicates that argument sits more comfortably with justification of actions. This doesn't mean that it is not possible to reason to the truth, just that it is more difficult than reasoning from the 'truth'.

Parmenides was using deductive argument to support ideas about the world that had earlier been supported by explanations. He was not the first, Xenophanes has earlier examples. But, what Parmenides and the Eleatics did indicates a recognition of what it is to reason as well as of how to reason. They set the criteria for what was to follow: if the sound deductive argument is the strongest form of persuasion, then in order to persuade or be persuaded, this is what it was going to take. The persuader and the audience had the tools necessary for, if not guaranteeing persuasion, at least making it more likely. Melissus laid out the template for deductive persuasion, and Zeno came up with ways to counter or refute those who disagreed. One provided tools for the devising of arguments and the other provided tools for the evaluation of arguments. This being the case, there is an alignment with what was expected to arise at some stage from the ATR perspective. This was the stage.

Constructing reasons is influenced by myside bias in that people are more interested and focused on producing arguments for their point of view than for others' points of view. In doing this, they are lazy: anticipating the response and counter-arguments of their intended audience and only producing arguments that are 'strong enough'. The direction of any subsequent deliberation will guide them as to which arguments persuade and which need further work. Therefore, according to the ATR, reasoners when producing arguments are biased and lazy and this is expected if the aim is persuading others in interactive contexts.

On the other hand, these same reasoners, when evaluating the arguments of others are more objective and demanding. They demand arguments to be of good quality and will expend more energy in deciding whether to accept them and the ideas they are supporting. This results in an asymmetry between production and evaluation.

In presenting his arguments, it is likely that Parmenides improved them over time in response to the responses of others. However, this improvement has a theoretical limit; once the most persuasive type of argument, the sound deductive argument, has been deployed, there are no other options. In reaching his final arguments, it is imaginable that Parmenides had to deal with opponents; after all, there is little he could point to as evidence for his ideas. This opposition could have been simple rejection of his ideas, or it could have been counter-arguments. A counter-



argument to Parmenides' All is One is really an argument for All is not-One, and Parmenides would have expended some energy in evaluating them, which, in turn, would have given him further ideas as to how to strengthen his original arguments.

We are now at the point where Parmenides has produced the strongest type of argument for his ideas. If people still rejected them on the basis of observables, another tactic was necessary. The tactic that arose was to refute the ideas of the refuters. This is what Zeno did on his teacher's behalf. If we have A or not-A and we have gone as far as we can go arguing for the truth of A, then the best next step is to argue for the falsity of not-A. If not-A can be shown to be false, then we are back having to accept A as true. Not only reasoning but strategy has now arisen – the arms race between methods of persuasion and methods of evaluation, as the following sections on Melissus and Zeno illustrate.

## 11.2 Melissus of Samos (fl. 5<sup>th</sup> C): The argument for All is One

Little is known of Melissus. He served as a commander of the Samian fleet and won two victories over the Athenian fleet in 441. The success was short lived as Pericles returned and defeated them, forcing them to pay indemnity. Melissus seems to have known of Parmenides, and supposedly Zeno, even though they were from different parts of Greece. He wrote a treatise, *On Being*, in defence of Parmenides' theory. In it, he restates the Eleatic ideas but in a more formalised, argumentative form. Many of his arguments are faulty, being of the form 'If A then B, but not-A therefore not-B'. This is technically the fallacy of denying the antecedent. However, this form of reasoning, although logically faulty, is often used and accepted in real life, as mentioned above and expanded below. Anyway, the various faults do not detract from what Melissus did. From a 'philosophical' perspective, he has been slightly discounted by, for example, Kirk, Raven and Schofield:

Melissus was not a great original metaphysician like Parmenides nor a brilliant exponent of paradox like Zeno. But he was inventive in argument, and his deduction of the properties of reality is in general much clearer than Parmenides'. It is his version of Eleatic doctrine to which the atomists chiefly responded and which shaped its presentation by Plato and Aristotle (Kirk, Raven and Schofield, 1983, p.401).

From a 'reasoning' perspective, Melissus can be seen as drawing together of the various lines of development of those who preceded him. The clarity of his arguments, even with their faults, was copied by the later natural philosophers, among others. In a way, Melissus could be considered the exemplar of what it is to reason.

I will expand Melissus' main arguments.

Whatever was, always was and always will be. For if it came to be, it is necessary that before it came to be it was nothing. Now if it was nothing, in no way could anything come to be out of nothing (Melissus, quoted by Simplicius, *Commentary on Aristotle's Physics* 162.23–26 = DK DK 30B1).

Now since it did not come to be, it is and always was and always will be, and it does not have a beginning or an end, but it is unlimited. For if it had come to be it would have a beginning (for if it had come to be it would have begun at some time) and an end (for if it had come to be it would have ended at some time). But since it neither began nor ended, and always was and always will be, it does not have a beginning or end. For whatever is not entire [or, "all"] cannot always be (Melissus, quoted by Simplicius, *Commentary on Aristotle's Physics* 29.22–26, 109.20–25 = DK 30B2).

If it came to be it had a beginning. It did not come to be; therefore, it did not have a beginning.

- (1)  $C \rightarrow B$
- (2)  $\sim C$  \_\_\_\_\_
- (3) Therefore,  $\sim B$

Often, an inference such as  $A \rightarrow B$  is held in the mind more as a biconditional, as has been explained above. If it is wet outside, then it is raining. Or, if it is raining, then it is wet outside. From a logic perspective, only the second inference would be accepted. The reason for it being wet outside could be for other reasons than it being raining, and therefore the first inference would not be accepted. Less formally, both inferences can be held, and when they are they are equivalent: raining  $\equiv$  wet outside.

What this means is that what is often considered faulty reasoning, such as the negation of the antecedent, is still accepted in everyday communication. An important function of reasoning and reasons is to persuade, and a logically faulty argument can persuade as well as a sound one.

The second point is that, with an equivalence, which actually consists of two inferences:  $(A \equiv B) \equiv ((A \rightarrow B) \& (B \rightarrow A))$ , if one is logically faulty the other can be brought to bear. By this I mean that using  $A \rightarrow B$ , we can construct the denying the antecedent fallacy:

- (1)  $A \rightarrow B$
- (2)  $\sim A$  \_\_\_\_\_
- (3) Therefore  $\sim B$

However, if we use the other equivalent inference,  $B \rightarrow A$ :

- (1)  $B \rightarrow A$
- (2)  $\sim B$  \_\_\_\_\_
- (3) Therefore  $\sim A$

- (1) If it came into being then it had a beginning.
- (2) It did not come into being. \_\_\_\_\_
- (3) Therefore, it did not have a beginning.

- (1) If it had a beginning then it came into being.
- (2) It did not come into being. \_\_\_\_\_
- (3) Therefore, it did not have a beginning.

The conclusions are the same. The arguments are different. It seems that in experimental situations both would be accepted in normal communication. In line with this, the first would probably come across as more persuasive. Melissus did not notice the fault, and neither would many people today (that only 18% of people correctly answer the Wason test supports this). (Barkow, Cosmides and Tooby, 1992)

Looking at the broader picture, the arguments Melissus used in the two fragments above support his conclusion that "Whatever was, always was and always will be". That is, whatever is, is eternal:

- (1) Whatever comes to be must come to be from what it is not.
- (2) But, what it is not is nothing or is-not.
- (3) Now, nothing can come from nothing, as Parmenides argued.
- (4) So, there can be no coming to be.

And

- (1) Whatever comes to be must also have an end.
- (2) Whatever is did not come to be.
- (3) Therefore, it will also not have an end.

Combining the two conclusions:

- (1) Whatever is did not have a beginning nor will it have an end.
- (2) Whatever does not come to be and does not pass away is eternal.
- (3) Therefore, whatever is, is eternal.

Besides being eternal, whatever is is unlimited. This is again denying the antecedent:

[Just as he says that what came to be at some time is limited in its being, he also wrote clearly that what always is is unlimited in being, saying:] But just as it always is, so also it must always be unlimited in magnitude. [But by “magnitude” he does not mean what is extended in space.] (Melissus, quoted by Simplicius, *Commentary on Aristotle’s Physics* 109.29–32 = DK 30B3).

- (1) Whatever has a beginning and end is neither eternal nor unlimited.
- (2) Being has no beginning or end.
- (3) Therefore, it is eternal and unlimited.

Despite the fault in the argument, the intention is clear. The argument can be fixed by inverting the starting inference:

- (1) Whatever is not eternal and unlimited has a beginning and end.
- (2) Being does not have a beginning and end.
- (3) Therefore, Being is eternal.

He continues in the same vein with the following claims, which I am only going to list:

“What-is is indivisible.” (Melissus, quoted by Simplicius, *Commentary on Aristotle’s Physics* 109.32-34 = DK 30B10).

“What-is is bodiless.” (Melissus, quoted by Simplicius, *Commentary on Aristotle’s Physics* 109.34–110.2 = DK 30B9).

“What-is is unlimited” (again). (Melissus, quoted by Simplicius, *Commentary on Aristotle’s Physics* 109.34–110.2 = DK 30B4).

“What-is is one.” (Melissus, quoted by Simplicius, *Commentary on Aristotle’s Physics* 110.5-6 = DK 30B5).

“What-is is all there is.”

(Melissus, quoted by Simplicius, *Commentary on Aristotle's On the Heavens* 557.14–17 = DK 30B5).

In fragment 30B7 Melissus provides a summary.

Thus it is eternal and unlimited and one and all alike.

And it cannot perish or become greater or be rearranged, nor does it feel pain or distress. For if it underwent any of these, it would no longer be one. For if it becomes different, it is necessary that what-is is not alike, but what previously was perishes, and what-is-not comes to be. Now if it were to become different by a single hair in ten thousand years, it would all perish in the whole of time.

But it is not possible for it to be rearranged either. For the arrangement that previously was is not destroyed, and an arrangement that is not does not come to be. But when nothing either comes to be in addition or is destroyed or becomes different, how could there be a rearrangement of things-that-are? For if it became at all different, it would thereby have in fact been rearranged (Melissus, quoted by Simplicius, *Commentary on Aristotle's Physics* 111.18–112.15 = DK 30B7).

Like a shooting star, Melissus lit the sky briefly and was not heard from again. Some have decided that the faults in his arguments meant that his conclusions could not be true and therefore need not be accepted. It could also be said that the faults in his arguments blunted their persuasive power, which could have led to his conclusions not being accepted – if in fact they weren't. His written arguments were obviously passed on. If he had reflected on and refined his arguments, devising strong, persuasive, sound arguments, would his conclusions then have been accepted?

### 11.3 Zeno of Elea (c.490-c.430): The arguments against All is Many

As mentioned above, Zeno was a student of Parmenides and he supported his teacher by dealing with those who disagreed with the All is One. In dealing with them, he introduced some important new tools. He could have supported his teacher in a positive way, stronger arguments, but as mentioned above, this would have been of nugatory value. After all, his teacher already had the strongest arguments, even if they were in a slightly awkward format. What Zeno did was, in alignment with Parmenides' challenge, to evaluate and refute counter-claims that there is change and movement in the world, and that time, etc. exist. In starting with the counter-claims of his audience rather than true premises, Zeno is also considered by Aristotle to be the founder of dialectic.

Although there are only four B fragments for Zeno, much has been written about him by later writers. More importantly, for us, is that what has been written about him refers to what he did, his method for refuting Parmenides' opponents.

He wrote a book of *Epicheiremata* (*Attacks*) in defence of Parmenides' theory of Being as One and Indivisible; his method was to take the opposite proposition that Things are Many, and derive two contradictory conclusions therefrom (Freeman, 1948, p.47).

He followed a certain pattern, which was later to become the basis of Socrates' *elenchus*. The form is *modus tollens*:

- (1) If all is many, then X
- (2) Not X.
- (3) Therefore, all is not many.

And,

- (1) If all is many, then  $\sim X$ .
- (2) Not  $\sim X$ .
- (3) Therefore, all is not many.

Or, which became *reductio ad absurdum* (RAA) or *reductio ad infinitum* (RAI):<sup>21</sup>

- (1) If all is many, then X and  $\sim X$ .
- (2) But X and  $\sim X$  is impossible or absurd.
- (3) Therefore, all is not many.

His skill lay in constructing and proving the initial inferences. For example, if all is many, then things must be infinitely small and infinitely great (fragment 1). What he did is well explained by Plato in his *Parmenides* (127a6ff abridged):

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<sup>21</sup> There are other ways of being impossible, or logically impossible, but they are not relevant to this point.

Once Parmenides and Zeno came to Athens for the Great Panathenaic festival. Parmenides was quite an elderly man, very gray, but fine and noble in appearance, just about sixty five years old. Zeno was then almost forty, of a good height and handsome to see. The story goes that he had been Parmenides' young lover. . . . Socrates and many others eager to listen to Zeno's treatise, for he had then brought it to Athens for the first time. Socrates was then very young. Zeno himself read it to them. . . . When Socrates had heard it, he asked Zeno to read again the first hypothesis of the first argument. When he had read it, he said, "How do you mean this, Zeno? If things that are are many, they must therefore be both like and unlike, but this is impossible. For unlike things cannot be like, nor can like things be unlike. Isn't that what you are saying?"

– Zeno: Yes.

The Great Panathenaic festival and other festivals gave philosophers and others an audience for their works. The private reading was also part of the process. This became more prevalent with the rise of the sophists, who needed to market themselves in order to attract students, fame, and money. Zeno gives a public reading of his treatise, above; the sophists later expanded beyond straightforward readings to "public displays of their brilliance by presenting set-piece persuasive speeches or allowing the audience to choose from a list of topics" (McKirahan, 1994, p.180 & p.369). The sophists charged admission.

Zeno may have benefitted, apart from reputation, by being invited to private readings or symposia, which seem to have been well catered (see above, Xenophanes' elegy to drinking parties, and the numerous depictions of the same in Plato and Xenophon). Fragments like the one above give valuable information as to the circumstances of Greek group discussion and deliberation.

Zeno's point, which Socrates is clarifying, is that if things are many they must therefore be both like and unlike, and this is impossible. To which Zeno agrees.

– Socrates: Now if it is impossible for unlike things to be like and for like things to be unlike, is it also impossible for things to be many? For if they were many they would have impossible attributes. Is this the point of your arguments – to contend, against all that is said, that things are not many? And do you think that each of your arguments proves this?

– Zeno: You have well understood the purpose of the whole work.

If it is impossible for things to be both A and  $\sim$ A, then it is impossible for things to be many. This is the crux of Zeno's approach. The other important factor is that Zeno begins with the beliefs of his interlocutors. For this reason, Zeno has been referred to as the father of dialectic (Diogenes Laertius, *Lives of the Philosophers* 8.57).

In the following fragment, Socrates points out that although what Parmenides and Zeno were doing could appear different, they were in fact doing the same thing but in different ways. Parmenides produced an argument to persuade that All is One. Zeno evaluated and refuted the counter claims or arguments of those who thought that All is Many.

Parmenides and Zeno were working with the following possible conclusions:

- (a) That all is one.
- (b) That all is not-one.
- (c) That all is many.
- (d) That all is not-many.

Parmenides argued for (a). His opponents, on the basis of perception, argued for (c). And, Zeno argued for (d), reasoning that all is either one or many. If it is not many, it must be one.<sup>22</sup> The excluded middle.

–Socrates: I understand, Parmenides, that Zeno here wants to be identified with you by his treatise as well as his friendship, for he has written somewhat in the same style as you, but by changing it he is trying to make us think he is saying something else. For in your poem you declare that the all is one and you do a good job of proving this, while he declares that it is not many, and furnishes many impressive proofs. Now when one of you says it is one and the other that it is not many, and each speaks so as to seem not to have said any of the same things, though you are saying practically the same things, what you have said appears beyond the rest of us.

–Zeno: Yes, Socrates, but you have not completely understood the truth of the treatise. . . . It is actually a defence of Parmenides' argument against those who try to make fun of it, saying that if what-is is one, the argument has many ridiculous consequences which contradict it. Now my treatise opposes the advocates of plurality and pays them back the same and more, aiming to prove that their hypothesis, "if there are many things," suffers still more ridiculous consequences than the hypothesis that there is one, if anyone follows it through sufficiently. I wrote it in this spirit of competitiveness when I was young, and then someone stole it, so I did not even have the chance to consider whether it should be made public (Plato, *Parmenides* 127b-128d). [My underlining]

Although the underlined section above are Plato's words, they match what Zeno actually did, and so the intention should be taken as accurate. Zeno clearly has a specific way of going about his evaluations and refutations, based on the type of reasoning Parmenides demonstrated, but taking things further. As such, it has been serving as a template for those who followed, and still is. However, this type of refutation is not all Zeno did; he is known for his paradoxes and the antinomies mentioned above.

Since our focus is on the process of reasoning in terms of reason-giving, I will unpack the argument in, according to Kirk, Raven and Schofield, "the only unquestionably authentic fragment of Zeno which [sic] has come down to us intact" (1983, p.266). I will follow this with two of Zeno's arguments against motion.

As already covered above, Zeno's method was to start with "there are many things".

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<sup>22</sup> It could be not-one, i.e. nothing, which the atomists introduced (the void) but 'not-one' is not the same as 'is-not'.



If there are many things, then  $X$  and  $\sim X$ .

Which is equivalent to 'If there are many things, then  $X$ '; and 'If there are many things, then  $\sim X$ '. His task, therefore, was to argue for both inferences. In fragment 3,  $X$  = limited and  $\sim X$  = unlimited (*apeiron*).

. . . in proving once again that if there are many things, the same things are limited and unlimited, Zeno's own very words are as follows.

'If there are many things, they must be just as many as they are, neither more nor less. But if they are as many as they are, they must be limited.'

If there are many things, the things that are are unlimited, since between things that are there are always others, and still others between those. Therefore the things that are are unlimited' (Simplicius, Commentary on Aristotle's *Physics* 140.29-33 = DK 29B3).

For the first inference, if there are many things, then there must exactly be that many and no more or no less. This being the case, they must be limited. For the second inference, if there are many things, no matter how many there are we can always squeeze more in between them. This being the case, they must be unlimited. Since what-is cannot be both limited and unlimited simultaneously, what-is cannot be many things. It must be one.

As to Zeno's arguments against motion, these are contained in what have become known as Zeno's Paradoxes. Parmenides' arguments support the idea of no motion; Zeno's arguments reject the idea of motion. These two arguments can be considered to start with "If there were motion . . ."

### The Dichotomy

First is the argument which says that there is no motion because what which is moving must reach the midpoint before the end (Aristotle, *Physics* 6.9 239b11-13 = DK 29A25).

It is always necessary to traverse half the distance, but these are infinite, and it is impossible to get through things that are infinite . . . (Aristotle, *Physics* 8.8 263a5-6, not in DK).

### The Achilles

The second is called 'Achilles'. This is to the effect that the slowest as it runs will never be caught by the quickest. For the pursuer must first reach the point from which the pursued departed, so that the slower must always be some distance in front. This is the same argument as The Dichotomy, but it differs in not dividing the given magnitude in half (Aristotle, *Physics* 6.9 239b14-20 = DK 29A26).

The reasoning is self-evident. The arguments and conclusion are that if there were motion not only would no one ever reach their destination, they would not even be able to leave home. Similarly, someone faster chasing someone slower would get infinitely close but never overtake. These are absurd conclusions and therefore the idea they proceed from must be rejected. There cannot be motion.

Zeno was known for more of these sorts of arguments, and apparently had at least 50 in the book he is credited with writing. Not all have survived. But, for our purposes, not all needed to have survived. What he did is clear; he came up with a fairly rigorous way for evaluating and refuting claims and arguments. The general opinion is that there are holes in all of his arguments, but this is neither here nor there for our purposes. The building blocks are now in place for the developments that followed. The Greeks were discussing how to devise and evaluate arguments, they were coming up with various 'sub-routines': deductive arguments, RAA, RAI, dialectic, the application of principles, the use of and reference to evidence, and the circumstances whereby these could be practised, reflected on, refined, and developed. Combine this with Melissus' formalised series of arguments and the Greeks were ready for the next innovation to arise: apply the various ways and methods of reasoning to the real world, specifically, the political assembly and the law courts.

## 12.0 THE LATER NATURAL PHILOSOPHERS

The natural philosophers who followed the Eleatics (or who were around at the same time) needed to respond to Parmenides' argument and his proscriptions of such things as change, motion, coming to be, and so on. As it was not possible to refute his arguments, work-arounds needed to be found. Otherwise, there would be nothing left to explain. Whatever ideas the later natural philosophers came up with needed to be supported by reasons. They could have tried to copy Parmenides' argument, but in fact continued to put forward explanations – more complex than Milesian explanations, but explanations none-the-less. Considering Anaxagoras, Empedocles, and Leucippus/Democritus, there are some interesting innovations in their speculations. None of them are true. They are evidence that the Greeks were continuing to come up with new ideas and express them, along with reasons, for selection. There is no evidence they survived selection and were believed, but they were transmitted, which suggests a different sort of selection criteria. I will confine the discussion to their ideas of an *arché*.

## 12.1 Anaxagoras of Clazomenae (c.500 – c.428)

With the idea of change ruled out, Anaxagoras responded by describing the world as a mixture of primary imperishable ingredients.

. . . it is right to think that there are many different things present in everything that is being combined, and seeds of all things, having all sorts of forms, colours, and flavours, and that humans and also the other animals were compounded, as many as have soul (Simplicius, *Commentary on Aristotle's Physics* 34.29–35.9, 34.21–26 = DK B4).

Change is therefore the rearrangement of these primary things, caused by *Nous*:

In everything there is a share of everything except *Nous* (Mind), but there are some things in which *Nous*, too, is present (Simplicius, *Commentary on Aristotle's Physics* 164.22 = DK B11).

*Nous* causes movement which causes separation off, and this results in what is observed.

When *Nous* began to move [things], there was separation off from the multitude that was being moved, and whatever *Nous* moved, all this was dissociated; and as things were being moved and dissociated, the revolution made them dissociate much more (Simplicius, *Commentary on Aristotle's Physics* 300.31–301.1 = DK B13).

It is the coming together of what was dissociated that results in the world we observe.

The Greeks do not think correctly about coming-to-be and passing-away; for nothing comes to be or passes away, but is mixed together and dissociated from the things that are. And thus they would be correct to call coming-to-be mixing-together and passing-away dissociating (Simplicius, *Commentary on Aristotle's Physics* 163.20–24 = DK B17).

Anaxagoras does not support his theories with deductive arguments, only explanations that are analogical but of a greater level of clarity and complexity than the Milesian explanations. It is clear that he is working around Parmenides' All is One. His idea is of a multitude of things, a sort of All in One. This idea in itself is fairly simple, but with the reasons accompanying it, it adds up to a fairly complex theory.

## 12.2 Empedocles of Acragas (c.490-c.430)

Empedocles' response to Parmenides and perhaps Anaxagoras (they were coeval) is a mixture of primary imperishable ingredients, but instead of many there are only six basic entities: Earth, Water, Air, and Fire, and Love and Strife. Each is a genuine being in the Parmenidian sense, but they are able to come into being and change, with the first four being moved by Love and Strife – two competing forces. Love causes the four elements to come together while Strife pulls them apart. This resembles coming to be and passing, which was proscribed by Parmenides, but not for Empedocles. This is a clearer and therefore more persuasive explanatory reason than that of Anaxagoras in that it supplies solutions to problems that arise with his vaguer idea of primary things and *Nous*, but it is still not clear enough to be more than an interesting fingerpost along the way.

They [i.e., the four elements] dominate in turn as the cycle evolves,  
and they decrease into one another and grow in their turn, as destined.  
For there are just these things, and running through one another  
they come to be both humans and the tribes of other beasts,  
at one time coming together into a single *kosmos* by Love  
and at another each being borne apart again by the hatred of Strife,  
until they grow together into one, the whole, and become subordinate.  
Thus in that they have learned to grow to be one out of many  
and in that they again spring apart as many when the one grows apart,  
in that way they come to be and their life is not lasting,  
but in that these never cease interchanging continually, in this way they are always  
unchanging in a cycle (Simplicius, *Commentary on Aristotle's Physics* 33.19–34.3 =  
DK B26).

They exist as separate entities, but are unchanging in a cycle. This is an interesting attempt to come up with reasons within the bounds of the Eleatic ideas, which were presumably known by at least some of the audience, who could be relied on to critically evaluate anything new and/or different. For this reason, an argument as well as an explanation might have made the theory more persuasive. But, arguments were not really used by the later natural philosophers. They were by Xenophanes much earlier, but he was not purely a natural philosopher.

### 12.3 Leucippus of Abdera or Miletus (fl. 5<sup>th</sup> C) and Democritus of Abdera (c.460-c.370)

Leucippus (if he existed, opinions vary) and Democritus are known as the atomists. There are some parallels between their ideas and modern atomic theory, but neither are considered accurate nowadays. According to the theory, an infinite number of atoms (*a tomos* = uncuttable) exist, with each being uniform, eternal, and unchangeable, which is meant to avoid the Parmenidian proscriptions. Individual atoms are imperceptible and differ from one another only in shape and size. The innovation is that they are posited to move within a void, or 'empty', which was a workaround of Parmenides' not-being. The atomists' void was meant to be equivalent to Parmenides' nothing or not-being (but, 'there is no not-being'). The void provided, in theory, a space for atoms to move, to come together and to move apart. In coming together they form the various physical observables. The result is that what looks like coming to be and passing away is really only alteration and rearrangement within the void.

Leucippus' opinion is this: All things are unlimited and they all turn around one another; the all [the universe] is both the empty [void] and the full. The worlds come to be when the atoms fall into the void and are entangled with one another (Diogenes Laertius, *Lives of the Philosophers* 9.30 = DK 67A1).

Leucippus and his associate Democritus declare the full and the empty [void] to be the elements, calling the former "what-is" and the other "what-is-not". Of these, the one, "what-is", is full and solid, the other, "what-is-not", is empty [void] and rare. (This is why they say that what-is is no more than what-is-not, because the void is no less than body is.) (Aristotle, *Metaphysics* 1.4 985b4-20 = DK 67A6)

After establishing the shapes, Democritus and Leucippus base their account of alteration and coming-to-be on them: coming-to-be and perishing by means of separation and combination, alteration by means of arrangement and position (Aristotle, *On Generation and Corruption* 1.1 315b6-15 = DK 67A9).

There is more to the atomic theory than I have presented above, but the main point is the positing of the void as a solution to Parmenides' 'there is no not-being'. There are two ways of responding to the void. The atomic theory only makes sense if the void is equivalent to not-being. Is it?

- (1) If it is not-being then it doesn't exist.
- (2) The void exists.
- (3) Therefore the void is not not-being.

The void is not nothing; it is something. And since it is something, and since what is is uniformly so, there is nowhere for the atoms to move. All is One.

- (1) What is  $\sim E$  cannot be E.
- (2) The void is E. (Thinking = Being)
- (3) Therefore the void cannot be  $\sim E$ .

The Eleatics' non-existent is not equivalent to the atomists' void. This being the case, the void is existent and Parmenides' arguments apply equally to it.

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## 13.0 THE SOPHISTS

### 13.1 Introduction

The English word 'rhetoric' is derived from Greek *rhetorike*, which apparently came into use in the circle of Socrates in the fifth century and first appears in Plato's dialogue *Gorgias*, probably written about 385 BC. . . . *Rhetorike* in Greek specifically denotes the civic art of public speaking as it developed in deliberative assemblies, law courts, and other formal occasions under constitutional government in the Greek cities, especially the Athenian democracy. As such, it is a specific cultural subset of a more general concept of the power of words and their potential to affect a situation in which they are used or received. Ultimately, what we call 'rhetoric' can be traced back to the natural instinct to survive and to control our environment and influence the actions of others in what seems the best interest of ourselves, our families, our social and political groups, and our descendants. This can be done by direct action — force, threats, bribes, for example — or it can be done by the use of 'signs', of which the most important are words in speech or writing. (Kennedy, 1994, p.3).

In this section, I look at two important sophists of the fourth century. These were coeval with many of the later presocratics and there seems to have been free exchange of ideas; after all, many of them would have attended the same symposia or public displays. The one important difference was that the itinerant teachers, who became the 'sophists', needed to make a living. There is little evidence of the natural philosophers having to work to live. In fact, Plato gives the impression that the average Athenian looked down on work and on those who had to work — it was for the poorer citizens, the metics, and the slaves. The itinerant teachers may have been from the upper classes in their own *polis*, but when they travelled to other *poleis* they would have had to support themselves. They probably did not have the skills (or the desire) to compete with those who had trades — metics. But, they were educated and what was available to them was teaching, provided they had something to teach for which there was a market and a demand.

With changes in the legal and political systems in Athens in the 5<sup>th</sup> century, over a comparatively short period of time there arose the need for the average person to be able to persuade and to counter-argue. This was an opportunity that suited these educated wanderers and they took steps to exploit it. As in any market, for the products that brought about the greatest benefits there arose the greatest demand.

Strictly speaking, Sophists were itinerant educators who operated independently and charged fees. Different Sophists taught different ranges of subjects, but all taught rhetoric, the art of constructing and delivering public speeches, which was seen as the key to success in public and private life (McKirahan, 1994, p. 363).

At the time there was an interesting mix of thinkers. Many were born around the same time, 500-490 BC, and on or near Sicily. They were all aware of Parmenides and some of what they did was a



response to him. It was also the time of a split into two lines of development. There was a continuation of theories about the world, and there also arose the interest in actions – justifications of past actions or of proposed actions. Protagoras, for example, dabbled in both streams, but obviously could only earn a living in the second one; teaching or passing on theories about the world had no obvious utility at the time.

What is crucial to the developments is that what had been developing with the natural philosophers, the use of reasons to persuade others to accept ideas about the world could now be employed to persuade others of the rightness or wrongness of actions taken (the law courts) or of actions proposed (the political assembly). This has been touched upon above, including in the *Iliad* and with Xenophanes' argument for the *polis* supporting and maintaining him. With changes in Syracuse first, and then in Athens, it was this need that became a driving force.

So, while the natural philosophers were expressing their ideas and their reasons across Greece, in Syracuse a new, unconnected line of development arose in response to citizens needing to apply to the courts for the return of their land and property. This line began as what was originally referred to as persuasion (*peitho*) and later came to be called rhetoric.

In 467 BC, a democratic regime was established in Syracuse and land and property that had been 'redistributed' earlier was being reclaimed by the original owners through the law courts. In order to help with this process, Corax and Tisias, or Tisias the Corax (crow),<sup>23</sup> who was apparently a lawyer, put together a treatise in the form of a handbook – how to persuade in a legal setting. He made two main contributions: (1) dividing the judicial speech into parts: proem, narration, statement of arguments, refutation of opposing arguments, and summary, and (2) the argument from probability, which was touched on earlier with the story of Apollo and two-day-old Hermes. Aristotle gives an example:

. . . for example, if a weak man were charged with assault, he should be acquitted as not being a likely suspect for the charge: for it is not probable [that a weak man would attack another]. And if he *is* a likely suspect, for example, if he is strong, [he should be acquitted]; for it is not likely [that he would attack another] for the very reason that it was going to seem probable [to the judges] (Aristotle, *Rhetorica*: 2.24.11).

While the sophists were mainly an Athenian phenomenon, the roots of what they taught arose elsewhere. The understanding of what it was to give reasons arose with the Eleatics and the need to be able to arose with the new legal and political contexts. The itinerant teachers recognised an opportunity to add to their syllabus and those who did it best became quite wealthy. The first two were Protagoras of Abdera and Gorgias of Leontini, and even though rhetoric went on to develop considerably (particularly with Isocrates in the 4<sup>th</sup> C), what these first two did is representative – they taught how to persuade through the application of reason in its ATR guise.

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<sup>23</sup> The discussion has been ongoing – were Corax and Tisias one or two people?

## 13.2 Protagoras of Abdera (490-420)

### 13.2.a A teaching story or an argument?

Socrates: . . . So if you can clarify for us how virtue is teachable, please don't begrudge us your explanation.

Protagoras: I wouldn't think of begrudging you an explanation, Socrates . . . But would you rather that I explain by telling you a story, as an older man to a younger audience, or by developing an argument?

. . .

Protagoras: On this subject [on good men teaching their sons, etc.], Socrates, I will abandon story for argument (Plato, *Protagoras* 320b8 and 324d3).

The earliest of the sophists was Protagoras, born in Abdera around 490 and died about 420. Hence, he was active during an important time for the development of reason. He seems to have spent some time in Athens and was connected with the circle around Pericles. He was the first to refer to himself as a Sophist, he charged fees for what he taught, and he became wealthy. He was known for a book of arguments that can be used to 'throw' an opponent, a book called the *Antilogies* or "Contrary Arguments", his "man is the measure" relativism, his scepticism of knowledge of the gods, and his claim to teach *arête* (virtue or excellence), supposedly the key to success in life. In the following fragments he is made to speak for himself.

[Protagoras on what he teaches and the value of his teachings.] My boy, if you associate with me, the result will be that the very day you begin you will return home a better person, and the same will happen the next day too. Each day you will make constant progress toward being better. . . . [Protagoras teaches a young man] good counsel concerning his personal affairs, so that he may best manage his own household, and also concerning the city's affairs, so that as far as the city's affairs go he may be most powerful in acting and in speaking (Plato, *Protagoras* 318a, 318e-319a = DK 80A5).

This fragment above establishes Protagoras' credentials as a teacher. Education in Greece was well established at the time, consisting of physical and intellectual training – *mousike* – which consisted of music, dance, lyrics and poetry. Reading and writing were learnt in the context of memorising, reciting and writing Homer and other ancient texts.

Plato allows Anytus in *Meno* to accuse the sophists of exactly what he was later to accuse Socrates of in the *Apology*,

By Heracles, Socrates, forbear! I only hope that no friend or kinsman or acquaintance of mine, whether citizen or stranger, will ever be so mad as to allow himself to be corrupted by them [sophists]; for they are a manifest pest and corrupting influence to those who have to do with them (Plato, *Meno*, 91c1).

### 13.2.b Higher education and how to succeed—

Protagoras is suggesting a ‘higher education’, learning how to succeed. In the following fragments he explains how this will be done. Again, it is in contrast with the traditional learning process.

Teaching requires nature and training. . . . Learning must begin at an early age (*Anecdota Parisiensia* I 171, 31 = DK 80B3).

Art (*tekhnē*) without practice and practice without art are nothing (Stobaeus, *Selections* 3.29.80 = DK 80B10).

Education is not implanted in the soul unless one reaches a greater depth (Pseudo-Plutarch, *On Training* 178.25 = DK 80B11).

### 13.2.c The ability to know the gods—the two sides of the discussion

The next fragment is Protagoras’ thoughts about knowing the gods. Although not an argument, the fragment does introduce what was to become a feature of the methods of the sophists, the two sides of the equation: “that they are or that they are not”.

Concerning the gods I am unable to know either that they are or that they are not or what their appearance is like. For many are the things that hinder knowledge: the obscurity of the matter and the shortness of human life (Eusebius, *Preparation of the Gospel* 14.3.7 = DK 80B4).

Not mentioned above but below is the idea that either side could be argued for.

Protagoras was the first to declare that there are two mutually opposed arguments on any subject (Diogenes Laertius, *Lives of the Philosophers* 9.51 = DK 80A1).

That is, equally strong arguments could be devised to persuade (1) that gods are, and (2) that gods are not, and this could be done despite the various things that hinder knowledge that he mentions. This strategy can also be applied to people, and this is what the sophists became known for. As an academic exercise, praising and blaming the same person would take some practice. In reality, taken into the law courts or the assembly, it could have significant real-world consequences.

This is making the weaker argument stronger. And people were rightly annoyed at Protagoras’ promise (Aristotle, *Rhetoric* 2.24 1402a24–26 = DK 80A21).

Protagoras made the weaker and stronger argument and taught his students to blame and praise the same person (Stephanus of Byzantium, s.v. *Abdera* = DK 80A21).

### 13.2.d Myside bias or epistemic confidence: What I think is right is right.

The question of what is right therefore arises. Is it right to praise someone who does not deserve praise, and vice versa? The problem becomes one of deciding which arguments to put forward and which arguments to accept. On this point, Protagoras' famous comment is the first reference to relativism of this sort:

A person is the measure of all things – of things that are, that they are, and of things that are not, that they are not (Sextus Empiricus, *Against the Mathematicians* 7.60 = DK 80B1).

No reasons are recorded, but, being a sophist, Protagoras presumably had them. Plato took "Man is the measure of all things" to mean there is no absolute truth, nothing beyond what each person believes to be the truth. Protagoras' statement has led to endless discussion. It seems to disregard Homer and the like, and to be in contrast to the 'philosophers' who were arguing for an objective, universal truth. Since Protagoras' reasons or arguments have not survived we cannot more rigorously evaluate the idea. Perhaps it was not referring to Truth, with a capital 'T' but rather right and wrong. What is right is what we believe is right, until we come to or are persuaded to change our mind. Without reasons, we are at sea. We have no way of evaluating the idea on the basis of someone else's reasons and so do so on the basis of the ideas we hold at the time, which may not be optimal. Reasons (explanations, arguments) make all the difference.

### 13.2.e Contradiction is impossible—reasoning about reasoning

Although the argument does not survive, Protagoras' idea that contradiction is impossible was later taken up by Prodicus and Antisthenes (both active after Protagoras' death); their arguments have likewise not survived other than a rough referral by Aristotle in *Metaphysics* (1024b20-1025a1).

He was the first to use in dialectic the argument of Antisthenes that attempts to prove that contradiction is impossible (Diogenes Laertius, *Lives of the Philosophers* 9.53 = DK 80A1).

The question is whether he actually believed this or whether it was an example of the sort of thing he did. Gorgias, in his *Helen*, refers to constructing arguments against what is commonly accepted as a sort of pastime or form of entertainment. Without reasons it can be difficult to decide, but this can be the case even with reasons – depending on the type and strength of the reasons. What is needed are the appropriate reasons, and these are determined by the outcome: reasons can be considered appropriate when they result in agreement and/or acceptance. And, this is what the sophists claimed to teach.

Finally is a fragment from the *Dissoi Logoi* (*Twofold Arguments* or *Contrasting Arguments*). It was written around 420 BC either anonymously or by an author who has been long forgotten. It gives examples of the sorts of arguments Protagoras or other sophists might write or have their student practice writing. The emphasis is on providing arguments for and against certain claims. What is important in exercises of this nature was that it forced the consideration of the opponents' points of view. The language and the way the arguments are laid out are repeated in other sophistic

fragments, and continue to this day in the form of university essays. This will become more evidence with Gorgias' *Helen* below.

(1) Twofold arguments are also stated concerning the false and the true, of which one declares that true *logos* [speech, statement] and false *logos* are different from one another, and others that they are the same.

(2) And I say the following. First, that true and false *logos* are expressed in the same words. Second, when a *logos* is spoken, if events have occurred the way the *logos* is spoken, the *logos* is true, but if they have not occurred, the same *logos* is false.

(3) Suppose it accuses someone of sacrilege. If the deed took place, the *logos* is true, but if it did not take place, it is false. And the *logos* of the defendant is the same. And the courts judge the same *logos* to be both false and true.

...

(7) As a result of the argument they say these things because if the thing occurred the *logos* is true, but if it did not then it is false. Therefore it is not their name that differs, but the fact of the matter.

(8) Moreover, if anyone should ask the jurors what they are judging (since they are not present at the events),

(9) these people too agree that the *logos* with which falsehood is mixed is false, and that with which truth is mixed is true. This is the entire difference (*Dissoi Logoi* 90.4).

True and false accounts are both different from and the same as each other. For example, they are the same in that the same words are spoken in expressing the account. But, they are different depending on whether the event occurred according to the account or not. If the event matches the account, *logos* is true. If the event does not match the account, the *logos* is false. In this way, true and false accounts are both the same and different.

The final points suggest the relevance of the argument to the real world. How can the jurors decide which accounts are true and which are false if they can be both? The answer seems to suggest probability. It doesn't give a clear method.

### 13.3 Gorgias of Leontini (c.487-376)

Socrates: And what is this thing [oratory, rhetoric] you're referring to?

Gorgias: I'm referring to the ability to persuade by speeches judges in a law court, councillors in a council meeting, and assemblymen in an assembly or in any other political gathering that might take place.

...

Gorgias: The persuasion I mean, Socrates, is the kind that takes place in law courts and in those other large gatherings, as I was saying a moment ago. And it's concerned with those matters that are just and unjust. (Plato, *Gorgias*, 452e1-4 and 454b4-6)

Gorgias of Leontini in Sicily was contemporary with Protagoras, both being born around 490. He described himself as a teacher of rhetoric (which had arisen in Sicily) and he had a good following. He visited Athens in 427 as part of an embassy from his *polis* and became recognised for his speeches. Due to his popularity and success at attracting students, he decided to stay. He lived until 100 or thereabouts.

Not much survives of his writings, and perhaps the philosophers were partly to blame for this: "Due in large part to the influence of Plato and Aristotle, the term *sophistry* has come to signify the deliberate use of fallacious reasoning, intellectual charlatanism and moral unscrupulousness".<sup>24</sup> On the other hand, since the sophists were teaching technique, nothing much needed to survive – each generation, once they had a good grasp of the techniques could create their own writings. The philosophers did seem to place more value ideas and therefore maintained and transmitted them, as the texts of Plato and Aristotle attest. This is not to suggest that the sophists did not do the same, only that if they did, evidenced has not survived. The writings of such as Gorgias can be considered text books, exemplars and exercises. Plato gives a good depiction of Gorgias that is generally accepted as fairly accurate in his dialogue of the same name.

#### 13.3.a The argument that nothing exists

The first fragment is Sextus Empiricus' report of Gorgias' argument for "nothing exists". It begins with a summary (1) – (3) and then arguments for each point. I will only present the argument for nothing exists.

- (1) Nothing exists.
- (2) If anything exists, it is incomprehensible.
- (3) If it is comprehensible, it is incommunicable.

- (1) Nothing exists.  
If anything exists, it must be either Being or Not-Being, or both Being and Not-Being.
  - (a) It cannot be Not-Being, for Not-Being does not exist; if it did, it would be at the same time Being and Not-Being, which is impossible.

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<sup>24</sup> Internet Encyclopedia of Philosophy, <http://www.iep.utm.edu/sophists/>

- (b) It cannot be Being, for Being does not exist. If Being exists, it must be either everlasting, or created, or both.
- i. It cannot be everlasting; if it were, it would have no beginning, and therefore would be boundless; if it is boundless, then it has no position, for if it had position it would be contained in something, and so it would no longer be boundless; for that which contains is greater than that which is contained, and nothing is greater than the boundless. It cannot be contained by itself, for then the thing containing and the thing contained would be the same, and Being would become two things – both position and body – which is absurd. Hence if Being is everlasting, it is boundless; if boundless, it has no position ('is nowhere'); if without position, it does not exist.  
(The arguments continue in this vein.) (Sextus Empiricus, *Against the Mathematicians* 7.65-86 = DK 82B3)

The arguments above are no off-the-cuff response to a “Why?” question. They took time and thought. They are a restating and restructuring of Eleatic ideas, without the faults. As a continuation of questions about the world, they add little but clarity.

### 13.3.b Judicial, deliberative, and epideictic rhetoric

However, interest and clarity about the world was not where the sophists were focused. They were in the business of teaching persuasion and rhetoric, and if they were going to attract students, they needed examples of what they could do in the arenas that counted – arguing for or against actions in the law courts, as accuser or defender, and arguing for or against proposed actions in the assembly. They separated speeches into three general types on the basis of purpose:

1. Judicial speeches – legal, forensic, with the purpose to accuse or defend
2. Deliberative speeches – legislative, political, with the purpose to exhort or dissuade
3. Epideictic speeches – ceremonial, with the purpose to commemorate or blame

An example of the first is the trial of Socrates. An example of the second is Alcibiades persuading the Athenians to invade Sicily in 415 (during the Peloponnesian War, when they were already busy fighting off the Spartans<sup>25</sup>). An example of the third is Pericles' *Funeral Oration*, given at the end of the first year of the Peloponnesian War

The point is that the sophists needed to be able to do more than construct crisper and clearer natural-philosophy-type reasons and arguments. They needed to be able to do what they were advertising as being able to do, teach people how to persuade when and where it became not only necessary but also crucial. The proof of the success of process was not whether others accepted the ideas but whether they changed their behaviour. The outcomes of sophistic-type persuasion were real-world actions that had real-world consequences. An idea can be considered good if when acted upon it brings about good consequences; reasons can be considered good if they persuade

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<sup>25</sup> The reason was to strip Sicily of resources in order to continue the fight against the Spartans, which does sound reasonable.

others to take the action. Gorgias' two surviving extended persuasive arguments, his *Encomium of Helen* and *Defence of Palamedes*, give ample proof of this focus.

### 13.3.c Gorgias, *Encomium of Helen*<sup>26</sup>

[1] For a city the finest adornment is a good citizenry, for a body beauty, for a soul wisdom, for an action *arête*, and for a speech truth; and the opposites of these are indecorous. A man, woman, speech, deed, city or action that is worthy of praise should be honoured with acclaim, but the unworthy should be branded with blame. For it is equally error and ignorance to blame the praiseworthy and praise the blameworthy. [2] The man who speaks correctly what ought to be said has a duty to refute those who find fault with Helen. Among those who listen to the poets a single-voiced, single-minded conviction has arisen about this woman, the notoriety of whose name is now a reminder of disasters. My only wish is to bring reason to the debate, eliminate the cause of her bad reputation, demonstrate that her detractors are lying, reveal the truth, and put an end to ignorance.

The underlined sections above illustrate pathos and ethos, two important components of rhetoric. Statements are made that are obviously true or that are going to be immediately accepted. The audience is praised and flattered in order to get them on side – this is more obvious in the section below: “For to tell those who know something they know carries conviction, but does not bring pleasure,” implying that the audience is knowledgeable and not to be spoken down to. Each component of the proem above has a specific function, which well illustrates what was being taught by the sophists. Some of this was from Tisias. What the sophists added was the logos or persuasive arguments, refutations and counter-arguments, which are in the following sections.

[3] That the woman I speak of is by nature and birth the foremost of the foremost, men or women, is well known by all. . . . [5] Who it was or why or how he took Helen and fulfilled his love, I shall not say. For to tell those who know something they know carries conviction, but does not bring pleasure. Now that my speech has passed over the past, it is to the beginning of my future speech that I proceed and propose the likely reasons for Helen's journey to Troy.

The details can be skipped . . . The section above ends with a clear statement of intent. And the beginning of the following section is what is called in modern academic writing the thesis statement. It is now up to the author to persuade the reader to agree to his four arguments. That is, what are needed are conclusions supported by persuasive reasons – either for or against.

[6] Either she did what she did because of the will of fortune and the plan of the gods and the decree of necessity, or she was seized by force, or persuaded by words, (or captured by love).

The outline of the argument: If she left for the first reason, then any who blame her deserve blame themselves, for a human's anticipation cannot restrain a god's inclination. For by nature the

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<sup>26</sup> Translated from the Greek by Brian R. Donovan.

<http://www.classicpersuasion.org/pw/gorgias/helendonovan.htm#cite>



stronger is not restrained by the weaker but the weaker is ruled and led by the stronger; the stronger leads, the weaker follows. Now, a god is stronger than a human in strength, in wisdom, and in other respects; and so if blame must be attached to fortune and god, then Helen must be detached from her ill repute.

**Argument 1: Helen was persuaded by the will of fortune and the plan of the gods because . . .**

- (1) The weaker are ruled by the stronger.
- (2) The gods are stronger than humans.
- (3) Therefore, humans are ruled by the gods.

If humans are ruled by the gods, then any actions taken by humans are at the behest of the gods. This being the case, the gods and not the humans (Helen) are to be blamed for any misfortune.

**Argument 2: Helen was persuaded by physical force because . . .**

[7] If she was forcibly abducted and unlawfully violated and unjustly assaulted . . .

- (1) It is a crime to forcibly abduct, unlawfully violate and unjustly assault someone.
- (2) The perpetrator and not the victim should be blamed and punished for this.
- (3) If Helen was forcibly abducted, unlawfully violated and/or unjustly assaulted, she was the victim.
- (4) Then, Helen, as the victim, should not be blamed or punished for any misfortune.

**Argument 3: Helen was persuaded by speech (*logos*) because . . .**

[8] If speech (*logos*) persuaded and deluded her mind, even against this it is not hard to defend her or free her from blame . . .

- (1) Speech is a powerful persuader and compeller.
- (2) If, through speech, someone is persuaded to do something, then the persuader is the wrongdoer, not the persuaded.
- (3) Therefore, if Helen was persuaded, those who persuaded her were the wrongdoers and therefore they should be blamed.

**Argument 4: Helen was persuaded by love because . . .**

[15] The case has been made: if she was persuaded by speech, her fortune was evil, not her action. The fourth reason, I discuss in my fourth argument. If it was love that did all these things, she will easily escape blame for the error that is said to have occurred.

Argument 4 has two parts: either love is a god or love is a sickness:

- (1) Love is a god.
- (2) Gods are stronger than humans.
- (3) Therefore weaker humans (Helen) can not refuse or reject them.

- (1) Love is a human sickness and a mental weakness.
- (2) This means any actions taken are not mistakes but misfortunes.
- (3) And, people (Helen) should not be blamed for misfortune.

### Summary and conclusion

[20] How then can the blame of Helen be considered just? Whether she did what she did, invaded by love, persuaded by speck, impelled by force or compelled by divine necessity, she escapes all blame entirely.

I have composed this discourse because . . .

[21] With my speech I have removed this woman's ill repute; I have abided by the rule laid down at the beginning of my speech; I have tried to dispel the injustice of blame and the ignorance of opinion; I wished to write this speech for Helen's encomium and my amusement.

Since the Helen was used as an exemplar, there is not much more that needs to be said. It provides a template and an example for anyone who would like to or need to argue for or against an idea of any kind. The method is clear. And, once having mastered the method, the text (book) is no longer necessary. This may be another reason for so few of the writings of the early sophists surviving.

#### 13.3.d The Defence of Palamedes

Palamedes was a major character in the Trojan War but not mentioned in the *Iliad*. Odysseus accused him of betraying the Greeks to the Trojans and soon after he was killed, perhaps by stoning, although there are other versions. In this defence, as in *Helen*, Gorgias takes it upon himself to present an epideictic speech that Palamedes might have given to a jury. The same strategy is followed as in Helen above, of presenting imaginary 'legal' arguments. In what follows, I have left the proem as it is, extracted the arguments, and then left the summary. The arguments rely to a degree on probability, which was at times frowned upon:

[O]ne who intends to be an able rhetorician has no need to know the truth about the things that are just or good or yet about the people who are such either by nature or upbringing. No one in a law court, you see, cares at all about the truth of such matters. They only care about what is convincing. This is called "the likely" and that is what a man who intends to speak according to art should concentrate on. Sometimes, in fact, whether you are prosecuting or defending a case, you must not even say what actually happened, if it was not likely to have

happened – you must say something that is likely instead. Whatever you say, you should pursue what is likely and leave the truth aside: the whole art consists in cleaving to that throughout your speech (Plato, *Phaedrus* 272d1-36).

The section above is Socrates discussing the art of rhetoric with Phaedrus; specifically, his disapproval of the use of arguing from probability. His response, at least in the dialogues, was to devise more rigorous forms of argument for his own ends. Since Socrates was engaged in what he did at the same time as Gorgias and the other earlier sophists (the 420s), his opinions seem valid – even if they were put in his mouth by Plato many years later. But, back to Gorgias' *Palamedes*:

[1] To the Jury: This trial is concerned not with death, which comes to all, but with honour: whether I am to die justly or unjustly, under a load of disgrace. You have the power to decide the issue; you can kill me easily if you wish, whereas I am powerless. If the accuser Odysseus were bringing the charge because he knew or believed me to be betraying Greece to the barbarians, he would be the best of men, as ensuring the safety of his country, his parents and all Greece, as well as the punishment of the traitor. But if he has concocted this charge through malice, he is equally the worst of men.

[2] Where shall I begin my defence? A cause unsupported by proof engenders fear, and fear makes speech difficult, unless truth and necessity instruct me – teachers more productive of risk than of the means of help.

The accuser cannot know for certain that I committed the crime, because I know for certain that I did not. But if he is acting on conjecture, I can prove in two ways that he is wrong.

**[3] First, I cannot have committed the crime.**

- (1) Treasonable action must begin with discussion.
- (2) But discussion implies a meeting.
- (3) A meeting was impossible since no one could come to me and I could not go to anyone.
- (4) It was also impossible to send a written message.
- (5) Therefore, treasonable action was impossible.

- (1) Myself, a Greek, and the enemy, a barbarian, did not understand each other's language.
- (2) Therefore, direct communication would have been impossible between us.
- (3) We could have used an interpreter, but this would have meant having an accomplice.
- (4) But, as no accomplice has been mentioned or suggested.
- (5) There was no communication.

**[6] What motive could I have had?**

- (1) I could not have seized rulership over the barbarian by persuasion, nor would they have handed it to me voluntarily.
- (2) Therefore, rulership over the barbarian was impossible.
- (3) Therefore, it couldn't have been my motive.

- (1) Wealth is needed by those who spend much; not by those who are masters of their natural pleasures, but by those who are enslaved by pleasures, or wish to buy honour with riches.
- (2) I have moderate means.
- (3) I call you to witness that my past life proves me not to be one who needs more.
- (4) Therefore, wealth was not my motive.

- (1) Honour accrues to virtue, not to a betrayer of Greece.
- (2) I had honour already, from you for my wisdom.
- (3) Therefore, my motive cannot have been ambition.

**[8] That you have no knowledge of your accusations is clear.**

Hence they must be conjectural, and you are the most villainous of men, to bring a capital charge relying on opinion – which is a most unreliable thing – and not knowing the truth. Conjecture is open to all in everything, and you are no wiser than anyone else in this. One must believe, not conjecture, but truth.

[9] You are accusing me of two opposites, wisdom and madness: wisdom in that I am crafty, clever, resourceful; madness in that I wished to betray Greece. It is madness to attempt what is impossible, disadvantageous, disgraceful injurious to friends and helpful to enemies, and likely to make one's life intolerable. But how can one believe a man who in the same speech, to the same audience, says the exact opposite about the same things?

- (1) Wisdom is the opposite of madness.
- (2) You are accusing me of both.
- (3) It is not possible for me to be both wise and not-wise; I must be one or the other.
- (4) To accuse me of both must mean that you are not telling the truth.

Here I stop. A summary of a long speech is worthwhile when one is speaking to a jury of inferiors; but before the leaders of Greece it is uncalled-for, as is the exhortation to pay attention or to remember what has been said.

According to Freeman, "This speech has at first sight little philosophical interest; but its influence on forensic oratory, and therefore doubtless on education, cannot be over-estimated" (Freeman, 1949, p.134).

The *Helen* and the *Defence of Palamedes* both demonstrate that the ability to devise and evaluate arguments intended to persuade had become well developed by the mid-420s. The two texts seem

more consistent with the idea of backward inferencing from the claim or conclusion Gorgias wants to push than with forward inferencing from immediate premises. Considering that Gorgias first visited Athens in 427, he was in his 60s and the Socrates in the dialogue *Gorgias* was in his 40s. Gorgias' fragments show a maturity both of thought and of method. The interests of the natural philosophers can now be left behind, and the method can be applied to other areas.

Although there are examples of arguments used for persuasion in historical and medical texts, I don't have the space to explore them. On the other hand, one of the most famous examples is in Aristophanes' *Clouds*, where he portrays Socrates as a sophist. The play was submitted to the City Dionysia in 423 BC and was judged third of the three plays that year. It was revised between 420 and 417 and circulated in manuscript form. The fact that a playwright could so accurately lampoon a 'sophistic' argument suggests the method was well known at the time. That Socrates was originally portrayed as a sophist suggests that Plato either made an effort in his dialogues to change the impression or that at the time, either the idea of 'philosophers' had not arisen or they were not considered to be different or engaged in different activities.

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## 13.4 Aristophanes

I have included some excerpts from Aristophanes' *The Clouds* because I believe they may give a more accurate account of what Socrates was doing, or was perceived to be doing, in the *agora* and elsewhere. His lampooning of the intellectual fashions in Athens at the time, particularly the sophists, and his use of Socrates as the main character, the head sophist of a local Thinking Shop, seems a little extreme. Speeches were being made in the law courts and the assembly and they were more substantial than in the play. Plato is perhaps a little extreme in the other direction. What was going on and what Socrates and the sophists were doing was perhaps somewhere between these. At this time, philosophy had yet to appear and so it was reasonably assumed that anyone engaging in sophist-like behaviour or associating with sophists was also a sophist. Another interesting point is Aristophanes' portrayal of sophists as "wretches . . . those quacks with pale faces, those barefoot fellows . . ." Plato later portrays philosophers as somewhat aristocratic, rarely needing to work, with plenty of free time on their hands. The portrayal of Socrates in *The Clouds* came back to haunt him at his trial, where Plato has him rue the 'false impression' of 23 years earlier.

The play is a comedy and starts with a conversation between Strepsiades and his son Phidippides. Later, Socrates enters the picture. I have focused on the setup and on one example of 'sophistic' wordplay. Someone Socrates respected was the sophist Prodicus, who was known for his teaching of linguistics and ethics. The wordplay below may have been foisted on Socrates due to his association. There is nothing in the play that resembles Plato or Xenophon's Socrates or his *elenchus* or *maieusis*. Had he not developed them by 423, was he not known for them at the time, or was what he was doing not understood or misinterpreted?

In the following excerpts, what comes across clearly is the use of reasoning in two senses. The first is the reasoning that seems to have gone into coming up with the ideas and arguments in the first place – discovering the world through the use of reason. The second is the reasoning that went into the various strategies to persuade other characters in the play to accept strange ideas. The point is made that if a person wanted to learn how to 'succeed' in certain areas, the sophists were the ones to approach.

### **Strepsiades**

That is the Thoughtery (Thinkery, Thinking Shop) of wise souls (sophists). There they prove that we are coals enclosed on all sides under a vast snuffer, which is the sky. If well paid, these men also teach one how to gain law-suits, whether they be just or not.

I do not know exactly [what they call themselves], but they are deep thinkers and most admirable people.

### **Phidippides**

Bah! The wretches! I know them; you mean those quacks with pale faces, those barefoot fellows, such as that miserable Socrates and Chaerephon?

### **Phidippides**

And what is it I should learn [from them]?

**Strepsiades**

It seems they have two courses of reasoning, the true and the false, and that, thanks to the false, the worst law-suits can be gained. If then you learn this science, which is false, I shall not have to pay an obolus of all the debts I have contracted on your account.

...

**Socrates**

Then what do you want to know?

**Strepsiades**

Not that, not that, but the art of false reasoning.

**Socrates**

But you must first learn other things. Come, what are the male quadrupeds?

**Strepsiades**

Oh! I know the males thoroughly. Do you take me for a fool then? The ram, the buck, the bull, the dog, the pigeon.

**Socrates**

Do you see what you are doing; is not the female pigeon called the same as the male?

**Strepsiades**

How else? Come now!

**Socrates**

How else? With you then it's pigeon and pigeon!

**Strepsiades**

That's right, by Poseidon! But what names do you want me to give them?

**Socrates**

Term the female pigeonette and the male pigeon.

**Strepsiades**

Pigeonette! Hah! By the air! That's splendid! For that lesson bring out your kneading-trough and I will fill him with flour to the brim.

**Socrates**

There you are wrong again; you make trough masculine and it should be feminine.

**Strepsiades**

What? If I say, him, do I make the trough masculine?

**Socrates**

Assuredly! Would you not say him for Cleonymus?

**Strepsiades**

Well?

**Socrates**

Then trough is of the same gender as Cleonymus?

**Strepsiades**

My good man! Cleonymus never had a kneading-trough; he used a round mortar for the purpose. But come, tell me what I should say! (Aristophanes, 419 BC)



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## 14.0 SOCRATES OF ATHENS (469-399)

Finally, Socrates. Being born in Athens in 469, he must have been influenced by the natural philosophers and the sophists. In his own words, he turned away from the natural philosophers for certain reasons.

As Plato portrays him, Socrates was an inquirer who came into contact with a range of thinkers and ideas (directly or written). The earliest portrayal is of his meeting with Parmenides, which may have been around 450-445, when Socrates was young – in his early twenties. He seems to have been one of a loose group who considered a range of topics. As he states below, he studied with the natural philosophers and rejected their focus on causes. There is little mention of studying with the sophists, but he clearly learnt and understood their methods.

When I was young, Cebes, I was tremendously eager for the kind of wisdom which they call investigation of nature. I thought it was a glorious thing to know the causes of everything, why each thing comes into being and why it perishes and why it exists; . . .

And again I tried to find out how these things perish, and I investigated the phenomena of heaven and earth until finally I made up my mind that I was by nature totally unfitted for this kind of investigation. . . .

I was so completely blinded by these studies that I lost the knowledge that I, and others also, thought I had before; . . .

I am far from thinking that I know the cause of any of these things, I who do not even dare to say, when one is added to one, whether the one to which the addition was made has become two . . .

Then one day I heard a man reading from a book, as he said, by Anaxagoras, that it is the mind that arranges and causes all things. . . .

My glorious hope, my friend, was quickly snatched away from me. As I went on with my reading I saw that the man made no use of intelligence, and did not assign any real causes for the ordering of things, but mentioned as causes air and ether and water and many other absurdities (*Plato, Phaedo, 95a*).

In other words, Socrates was looking for reasons and not physical explanations. Why things are and not how they are. Not finding what he was looking for, he came up with two methods of his own: the *elenchus*, or inquiry or refutation:

Then let us again examine whether that is a sound statement, or do we let it pass, and if one of us, or someone else, merely says that something is so, do we accept that it is so? Or should we examine what the speaker means? (*Plato, Euthyphro, 9e3*).

And the *maieusis*, or 'midwifery':

Now, my art of midwifery is just like theirs in most respects. The difference is that I attend men and not women, and that I watch over the labour of their souls, not of their bodies. And

the most important thing about my art is the ability to apply all possible tests to the offspring, to determine whether the young mind is being delivered of a phantom, that is, an error, or a fertile truth (Plato, *Theaetetus*, 150a8).

Both are based on an understanding of reason and argument, and both are carried out dialectically.

Socrates' methods were known and used by the sophists; however, while they used reason to persuade, Socrates used it to inquire. His *elenchus* can be found earlier with Zeno and his refutations, RAA and RAI, and other strategies. His *maieusis* can be found with Parmenides and Melissus, in the forward-inference interpretations of what they did in their arguments. Socrates used them to test (refute) knowledge and to attempt to discover truth, and he did it by the application of the principles of valid inference.

#### The *elenchus*:

Statement elicited – opening premise	(1) A is B
Premises added to the opening premise	(2) <u>B is C, and C is D, or C is not-A</u>
Conclusion drawn from the premises	(3) A is D, which is absurd, or (3') A is not-A, which is a contradiction

Since the conclusion is absurd or a contradiction, there must be something wrong with the opening premise.

#### The *maieusis*:

Statement elicited – opening premise	(1) A is B
Premises added to the opening premise	(2) <u>B is C, and C is D</u> _____
Conclusion drawn from the premises	(3) A is D, which was not known before

Another important consideration is Socrates' focus on definition. For him, correct definition leads to correct action. He asks Meno for generalisations or definitions, what he calls at one point, *simile in multis*, the similar in the many:

Tell me, what is this very thing, Meno, in which they are all the same and do not differ from one another? Would you be able to tell me? (Plato, *Meno*, 72b9)

Meno: . . . if you are seeking one definition to fit them all.

Socrates: That is indeed what I am seeking (Plato, *Meno*, 73d1).

You do not understand that I am seeking that which is the same in all these cases? (the *simile in multis*) (Plato, *Meno*, 75a2).

. . . tell me what virtue is in the universal, and do not make a singular into a plural . . . (Plato, *Meno*, 77a4)

. . . but a principle which has any soundness should stand firm not only just now but always (Plato, *Meno*, 89c8).

Unlike the sophists, Socrates did not accept payment for what he 'taught' and he didn't devise arguments for both sides (in Plato; in Aristophanes, this was exactly how he was portrayed). In fact, what he did aligns with the ATR; he evaluated ideas and beliefs held by his fellow citizens about what they thought was right. He had no ideas of his own to push and hence no arguments supporting them. He was the artisan applying his craft. So, instead of long explanations or teaching stories:

[Gorgias] has taught you the habit of answering questions in a grand and bold style, which becomes those who know, and is the style in which he himself answers all comers . . . (Plato, *Meno*, 70b3)

Which Socrates himself was able to do, as mentioned and demonstrated in *Meno* and several other dialogues:

Would you like me to answer you after the manner of Gorgias, which is familiar to you? (Plato, *Meno*, 76c4)

He engaged in the dialectic dialogue, which was a question and answer process carried out in a certain way that used only those ideas provided by his interlocutors. That is, as the following states, only those premises provided and held to be true by his audience:

Socrates: And if he were a philosopher of the eristic and antagonistic sort, I should say to him: You have my answer, and if I am wrong, your business is to take up the argument and refute me. But if we were friends . . . I should reply in a milder strain and more in the dialecticians' vein; that is to say, I should not only speak the truth, but I should make use of premises which the person interrogated would be willing to admit (Plato, *Meno*, 75c8).

Socrates: Do you remember how, in the example of figure, we rejected any answer given in terms which were as yet unexplained or unadmitted? (Plato, *Meno*, 79d1).

Much has been made of Socratic irony, "a pose of ignorance assumed in order to entice others into making statements that can then be challenged",<sup>27</sup> but when what Socrates was doing is fully understood, it becomes clear. He was not claiming to know that X, Y, and Z; he was testing others' understanding, and as dialectic, this needed to start with their opinion. The fact that few of their ideas survived the *elenchus* illustrates his point that we don't really know. However, by engaging in the process, we reach this conclusion for ourselves as a result of participating in the process (which must be dialectic). We persuade ourselves.

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<sup>27</sup> Oxford Dictionaries, [https://en.oxforddictionaries.com/definition/us/Socratic\\_irony](https://en.oxforddictionaries.com/definition/us/Socratic_irony)

Socrates: Answer my questions – that is all.  
 Alcibiades: Nay, I should like you to be the speaker.  
 Socrates: What, do you not wish to be persuaded?  
 Alcibiades: Certainly I do.  
 Socrates: And can you be persuaded better than out of your own mouth?  
 Alcibiades: I think not.  
 Socrates: Then you shall answer; and if you do not hear the words, that the just is the expedient, coming from your own lips, never believe another man again.  
 Alcibiades: I won't; but answer I will, for I do not see how I can come to any harm (Plato, *Alcibiades 1*, 113a6ff, abridged ).

In this, there is a direct link to Xenophanes; we either don't know or think we know but don't or think we know and do but do not know that we are right. The reason Socrates *elenchus* was so memorable was the emotions it caused to arise, which has been called above, 'dumbfoundment'.

Meno: I am at my wits' end . . . you seem to be like the flat torpedo fish, who torpifies those who come near him and touch him, as you have now torpified me (Plato, *Meno*, 80a5).

It is when this vulnerable, or annoyed, state is reached that Socrates suggests the second part of the process, the *maieusis*, the working towards the truth based on a starting premise that can be accepted. This process is comparable to the CTR interpretation of reasoning, forward inference to a conclusion. In the dialogues, it is a conclusion that is a definition of courage, or justice, or virtue itself, or one of the other virtues, in the working belief that if a person has a true definition of virtue they would naturally act in accordance with it. We only act against our best interests if we are not sure what they are and/or if we don't know which action is most appropriate.

Another important point is that Socrates would not provide counter-arguments. If someone did not agree with a particular statement, Socrates would not force the issue but move on to another statement.

<p>Will you accept statement A?</p> <p>No.</p> <p>Ok. If you won't accept statement A, will you accept statement B?</p> <p>Yes.</p> <p>Right, we can continue.</p>	<p>Example: taken from <i>Alcibiades I</i>, reference below.          (If you learnt something, you must have learnt if from a teacher.)</p> <p>(If you didn't learn it from a specific teacher; you must have learnt if from the many (<i>hoi polloi</i>))</p>
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Plato displays his various reasoning skills in his dialogues, such as when he has Gorgias ask what sort of answer Socrates would prefer (mentioned above). Another is in *Meno* when he refers to

hypothesis testing. Although this is basically what the *elenchus* is, Socrates did not seem to refer to what he was doing in these sorts of terms.

Socrates: At any rate, will you condescend a little, and allow the question 'Whether virtue is given by instruction, or in any other way', to be argued upon hypothesis?

...

Socrates: Then if virtue is knowledge, virtue will be taught?

Meno: Certainly.

Socrates: Then now we have made a quick end of this question; if virtue is of such a nature, it will be taught; and if not, not?

Meno: Certainly

Socrates: The next question is, whether virtue is knowledge or of another species?

Meno: Yes, that appears to be the question which comes next in order.

Socrates: Do we not say that virtue is a good? This is a hypothesis which is not set aside. (Plato, *Meno*, 8631ff).

#### 14.1 Alcibiades needs to know what justice is

Instruction implies that what is being passed on is known and understood beforehand. Plato's dialogue *Alcibiades* can be used to illustrate this. The starting premise is accepted: "Those who are going to teach anything should first know it themselves." But, how is Socrates going to persuade Alcibiades that he doesn't know what justice is and that he needs to find a teacher – before attending the assembly and making his first speech? Of the many good arguments in Plato, this one is presented particularly clearly. I have summarised it.

Socrates: To be a leader you need to know what justice is.

Alcibiades: I know what justice is.

Socrates: How did you learn? Who was your teacher?

Alcibiades: I didn't have a specific teacher; I think I learnt about justice from "the many" (*hoi polloi*).

Socrates: You cannot call "the many" serious teachers.

And if you didn't learn from a serious teacher how can you know you know what justice is?

Alcibiades: Why can't "the many" be competent to teach?

Socrates: (1) Those who are going to teach anything should first know it themselves.

(2) Those who know a subject should agree with each other and not differ over what the subject is.

(3) If "the many" differ it must mean they don't know the subject.

(4) As you know, "the many" do differ in their ideas of what justice is.

(5) Therefore they do not know what justice is, and therefore they are not competent to teach it.

(6) You need to look for another teacher (Plato, *Alcibiades 1* 106c2ff, abridged).

Being able to instruct is the result of a process that includes self-conscious reflection, formalisation and perhaps systematisation. It also means adding these to a syllabus or curriculum to ensure they

are replicated and transmitted and also to minimise transmission errors. Ideas arise, survive selection, are transmitted, and are then superseded on a regular basis. While they are no longer accepted as true they are still transmitted. Sometimes this is passive, remaining in the records or the tribal memory, but other times it is active, being taught as history of ideas and such. There must be some benefit in continuing to transmit formerly-true ideas, but it is not always easy to determine what it is. Much of the records of the presocratics exemplify this point. Culture is continuing to change, but it would be a lot 'thinner' without at least some knowledge of what came before.

## 14.2 Summary

What Socrates did demonstrates that ATR-type reasoning was alive and well by 399 BC, and even earlier. How to construct arguments intended to persuade was being taught directly by the sophists and perhaps, by imitation, by Socrates. There are no dialogues where he actually teaches how to devise reasons or arguments, but Plato fully understood; otherwise, he wouldn't have been able to portray it in his dialogues. This applies equally to evaluation.

That people hold ideas and then confabulate reasons is demonstrated by Socrates' use of the *elenchus*. His interlocutors change their reasons freely through the process of backwards inference. If one reason is not accepted, they reach for a more persuasive one (Haidt, 2012, p.45-47). That it is easier to inference backwards than forwards (in the CTR sense) is also suggested by the lack of successful attempts at the *maieusis* in the dialogues.

By 399, therefore, there were three lines of development. The first was the natural philosophers answering questions about the world. ATR suggests that this would have been done with ideas arising intuitively and then backward inferencing to reasons as support – the theories of the natural philosophers. As noted, what Parmenides did, his All is One, no change, no motion, can be explained in both ATR and CTR terms. For those natural philosophers who followed, his theory could be considered a starting point and has arguments a way to devise further theories that contained many, change and motion.

The second line was the sophists, teaching the art of persuasion to those who were interested or who needed it. They had certain devices and types of arguments and counter-arguments and could make the weaker argument the stronger. However, this is a relativistic criticism which could only hold if someone actually knew the truth or the facts, and people are notoriously unreliable witnesses. From an ATR perspective, the same criticism could be made of the natural philosophers along with Plato and his ilk. There is no truth, only ideas we accept or are persuaded to accept as true. The sophists were in the business of justifying actions already taken or proposed, not really the question of what is a right action, and definitely not the question of the *arché* and such.

The third line was Socrates' response to the natural philosophers and the sophists. Instead of judging actions after the fact, wouldn't it be better to know what a virtuous action is first and then take it? That is, judge an action by principle rather than outcome. To be able to do this, he said, you should be able to tell me what a virtuous action is. In cultural evolution terms, this is the selection phase – expose definitions to some selective mechanism and accept those that survive. As the

evaluation becomes more rigorous the arguments become stronger, until with Socrates, nothing but sound arguments would do, and sound counter-arguments.

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## 15.0 DISCUSSION AND CONCLUSION

Preparing this thesis has been a real-world experience of the argumentative theory of reasoning. Throughout the process I have been able to express a range of ideas to my supervisor, Micheal-John Turp, for selection. Some have survived; many have not. The process of needing to provide reasons for my ideas as well as reflecting on and responding to refutations and counter-arguments has made me realise how important myside bias, selective laziness, and consideration of the audience are. As to those of my ideas that did not survive, some I am willing to change my mind about and accept Michael-John's more persuasive accounts, but for others I still have some epistemic confidence but obviously not the skills to be able to devise a persuasive enough argument for. In writing the thesis, I am aware of the expected audience and need to consider what will be needed in order to persuade. In alignment with selective laziness, I do enough to persuade and no more. However, since my evaluation of the expected audience may be skewed, it may be a worthwhile strategy to aim a little higher. Overall, this thesis is a demonstration of my ability to reason in the ATR sense. To devise arguments intended to persuade, in the light of numerous other refutations and counter-arguments that I have in turn evaluated and reached decisions on.

The thesis started with the question of whether to accept Aristotle's claim or not. Was there logic, or anything like it, before he came onto the scene? Initially, this seemed a simple question to answer. The reasoning that was being carried out in Greece consciously and deliberately was something like logic, without the systematisation. It became apparent that before the question could be answered properly a second question needed to be addressed: what sort of reasoning are you talking about? The mental process of reasoning is possibly the same each time we carry it out, but the uses to which it is put, its function or functions, do vary. The recently arisen argumentative theory of reasoning introduced the idea that the main function of reasoning is argumentative. This meant that there were two possible ways to answer the question, from the ATR perspective and from the CTR perspective.

The question had already been answered from the CTR perspective, and it was that there was reasoning but not logic before Aristotle, and perhaps Aristotle had other reasons for his claim. He may have been marketing his school. If the main function of reasoning is argumentative, then much of what has been said about the Greeks becomes moot. Any account that has them becoming better and better reasoners in the CTR sense misses the point if in fact the developments were in the ATR function. That is, they were becoming better and better at coming up with reasons for their intuitively arising beliefs about the world, and the theories that they are known for were not the result of forward inference but of backward inference after the fact. At the same time, in the face of these various new ideas and reasons they needed to and did become more objective and demanding in evaluating them.

It now appears that the backward/forward inference description is a little simplistic. Someone may state an idea plus reasons in order to persuade. If the idea had arisen intuitively, the inferencing would have been backward, as described above. The listener would then evaluate the idea on the basis of the supporting reasons or argument. However, it might occur that someone hears an idea about an action without reasons or argument to support it. In this case, it is



reasonable to assume the person would forward inference in order to consider consequences and then judge the proposed action on this basis. Is this the fuzzy divide between ATR and CRT? Or, does it give us some idea of how CTR-type reasoning arose – a development from forward inferencing from unsupported statements of what ought to be done to forward inferencing from accepted ideas about the world to new and different ideas and theories?

So, the conclusion is that over the time considered, the Greeks became better reasoners in the sense of coming up with and evaluating reasons. These reasons were in the form of explanations and justifications. Explanations of how things are or come to be. Justifications of past, present or proposed actions. Parmenides' innovation, of using an argument to justify rather than explain how All is One added a new alternative reasoning; one that survived selection and went on to become of value. Arguments were still used to justify actions, but it was the action of believing that an idea or explanation about the world was true.

In this way, reasons in the form of arguments were introduced into natural philosophy. In working out what Parmenides did, reasoning was also recognised for what it was, a form of persuasion, its benefits noticed, and it developed in its natural domain – communication, persuasion and cooperation. With the sophists. And, with tools accumulating.

There were certain conditions in Greece at the time that favoured the developments. The Greeks were free to express ideas. They were free to evaluate ideas. There was a need to support ideas with reasons. There were the various deliberative settings and the competitive nature of the time. There was exposure to different and foreign ideas, which contributed to variation. On the other hand, not many of the ideas about the world were true. There is no telling that they survived selection, but they were recorded and transmitted along with the accompanying reasons in many cases, for other reasons. The way or ways of reasoning developed along with the products – the explanations and justifications, the arguments. This being the case, the situation in Greece matches fairly closely Sperber and Mercier's description of ATR-type reasoning.

The idea that truth can be reasoned to arose and this became a side effect, whether it is actually possible or not. By the late 5<sup>th</sup> C the Greeks were applying reason consciously and deliberately across a range of areas. That is, they were inventing and teaching, which means an understanding and a formalisation. This was before Aristotle. There was no logic before Aristotle, but there was not nothing. Reasoning was well developed.

I believe that having an alternative account of the Greek development of reasoning, based on the ATR, is a worthwhile return on the investment in reinterpreting the records. It is at least as likely, and perhaps even more likely, to be an accurate account. Whether it is accepted depends on the ability to put the ATR into practice, and to persuade others to accept the findings – the main function of reasoning. If the reasons, explanations and arguments are lacking in some way, it may make the findings less persuasive, but does it make them less true? It is difficult to say.

Socrates: Then true opinion is as good a guide to correct action as knowledge; and that was the point which we omitted in our speculation about the nature of virtue, when we said that knowledge is only the guide of right action; whereas there is also right opinion.

Meno: True.

Socrates: Then right opinion is not less useful than knowledge?

Meno: The difference, Socrates, is only that he who has knowledge will always be right but he who has right opinion will sometimes be right, and sometimes not.

Socrates: What do you mean? Can he be wrong who has right opinion, so long as he has right opinion? (Plato, *Meno*, 97b1)

...

Socrates: I too speak rather in ignorance; I only conjecture. And yet that knowledge differs from true opinion is no matter of conjecture with me. There are not many things which I profess to know, but this is most certainly one of them (Plato, *Meno*, 98b1).

In believing that demonstration can guarantee knowledge, Aristotle was in agreement with Sperber and Mercier. No matter how ideas arise in the first place, the best and most powerful way to persuade others to accept them is demonstration, sound deductive arguments. This is not easy to do; it takes time and effort, cognitive resources, in order to devise these sorts of arguments. The benefits, however, must be worth it, and they include making the idea or theory impossible to refute or counter-argue, guaranteeing others will accept it, and other important considerations such as reputation. This is of value in such areas as marketing and advertising, and in academia, where the argument still reigns.

True opinion and knowledge, it seems, turn out to be the same thing. The only test is subjective, what others can be persuaded to accept. Interestingly enough, what is needed in order to transform true opinion into knowledge, an account or justification, is precisely what is needed in order to persuade others to accept it as such. Aristotle's demonstration either guarantees knowledge or guarantees that true opinion is accepted as knowledge. Either way, the sound deductive argument is the strongest form of persuasion, it seems. But, this is dependent on the truth of the immediate premise, which, as Aristotle states, just sometimes has to be taken on faith. So, while reason functions well in its argumentative and evaluative guises, the various problems it encounters in its ratiocination guise, pointed out since Aristotle, means that it should not be the only option in seeking the truth.

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