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Airs, Waters, Places in Context: Theory and the Language of Proof in *AWP*

In her erudite study of Herodotus' intellectual context, Rosalind Thomas frequently and persuasively links Herodotus' method and language to the medical tradition burgeoning in the latter half of the fifth century. For Thomas, both Herodotus and the Hippocratics utilize a "rhetoric of proof" to gloss particularly tendentious sections of their arguments.[1] Such rhetorical proof language elides the theories and assumptions upon which it rests and parades itself as simple and empirical. For example, Thomas provides the proof in *Airs, Waters, Places* (*AWP*) that Scythians must have moist constitutions because they cauterize themselves (20.1). As she points out, this "proof" assumes, among other things, that self-cauterization can *only* be intended to dry oneself and that cauterization dries a moist constitution. Along with *On the Art, On Ancient Medicine,* and *On the Nature of Man, AWP* is classed as a Hippocratic treatise that engages in the rhetoric of proof, if "to a lesser extent" than the three more lecture-like and vivid texts.

Thomas' focus on the rhetorical aspect of the language of proof falls in line with Philip van der Eijk's call for scholars to articulate with finer precision the "grammar of

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[1] Thomas 2000, 199-200.

scientific discourse" in the ancient world.[2] In this light, one might describe Thomas' work as an initial step toward articulating a "grammar of proof;" that is, the implicit or unconscious conditions that delimit the use of proof language in presenting knowledge and persuading readers. In particular, Thomas offers a study of what one might call "the how" of proof discourse—the types of proofs and the methods of proving their claims. There remains, however, a need for a critical apparatus to understand the corresponding "where" of the language of proof so that scholars may garner efficacious evidence from the epistemic contexts in which proofs are found.

In this paper, I hope to sketch such an apparatus through a focused study of the proofs offered in *AWP.* I have chosen this treatise for two reasons. First, it appears more centrally situated within the spectrum between "rhetorical" and "scientific" proofs. As Thomas herself notes, this text is markedly less rhetorical than, say, *On the Nature of Man,* yet also clearly more protreptic than a "sober essay," such as *Epidemics.*[3] Second, *AWP* uses the term τεκμήρια ("proof/evidence") six times throughout the work, more than any other Hippocratic text. This treatise therefore offers both the most quantitative material for study and a well-rounded qualitative selection of proofs.

By considering these six proofs, I aim to buttress Thomas' analysis of the language of proof by providing another avenue by which to gain insight into Greek intel-

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[2] van der Eijk 1997.

[3] Thomas 2000, 197.

lectual history. Not only does "the how" grant evidence for shared methodological tendencies between genres and authors (as in Thomas' study), "the where" of proof language can also provide evidence for the specific persuasive goals of a given text; goals which, when a number of texts have been studied, may yield a deeper understanding of a particular intellectual environment. Thus, while Thomas uses the language of proof to reveal methodological connections between authors and schools, this paper outlines how proof language may also illuminate teleological connections.

I will use *AWP* as a test case for such a study. I argue that consideration of the epistemic conditions of the proof language (the where) reveals a consistent argumentative purpose for the treatise. This purpose is to defend the author's view of the natural world, whether natural processes, such as evaporation and freezing, or natural states, such as infertility. I suggest that such insistence on proving accounts of specific natural operations presents the author of *AWP* as attempting to annex certain aspects of the natural world into what I will call the "empire of knowledge." At the conclusion of the paper, I offer a quick snap-shot of how this project links our Hippocratic author to larger trends of Ionian natural science. This brief account attempts to demonstrate generally how one can use the results of a study of the epistemic goals of a text to tie new bonds among thinkers and "schools."

Before I can tackle the particularities of *AWP,* however, I must first sketch the theoretical apparatus with which I am working. In the first part of the paper, therefore, I

begin by explicating what I call the "horizon of assent," if I may borrow a metaphor from Hans Robert Jauss,[4] and the aforementioned "empire of knowledge." I then consider how these conceptual models may shed light on van der Eijk's "grammar of scientific discourse." In the second part of the paper I will turn to use this theoretical model in the specific case of *AWP* and examine the language of proof its author utilizes. This section begins by briefly describing the argumentative context, type of claim, and kind of proof for the six instances of τεκμήρια. This data forms the foundation for my argument that the author consistently uses the language of proof to defend his own account of certain natural processes. To conclude I briefly suggest how this account of a rhetorical purpose of *AWP* may link this text to Ionian natural science.

It may appear somewhat surprising, especially given that Thomas uses the *Hippocratic Corpus* as the foundation for her comparison with Herodotus, that little has been done to study closely the language of proof used throughout the corpus. For its part, the language of proof has been studied within ancient historiography,[5] philosophy,[6] and rhetoric.[7] Apart from their discursive aspect, the proofs themselves are often used as evidence of a general Hippcratic methodology, which is typically linked with the incipient

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[4] Jauss 1990.

[5] See Lateiner, (1986) and Thomas (1998).

[6] See McAdon (2003); Grimaldi (1980); and McAdon 2004).

[7] See Montefusco, 1998); Noël 2011); and Reguero 2009).

empirical/scientific modes of thinking associated with the Ionian scientific milieu.[8] In recent years, scholars have grown more interested in the rhetorical aspects of the *Hippocratic Corpus* and its treatises.[9] There remains, however, the need for a fuller treatment of both the rhetorical and philosophical implications of the language of proof utilized throughout many of the texts in the *HC*. Although this paper does not offer such a full treatment, I do hope, in providing a more limited analysis, to set the foundation for further study.

I. The Horizon of Assent

As Rosalind Thomas points out for Herodotus, but (I would argue) is true for every author at this early period, the language of proof appears when "a difficult, uncertain, or controversial idea" is under discussion.[10] Thomas takes this as indicative of Herodotus' rhetorical use of proof language, apparently as opposed to some pure use of such language. It is on this last point that I disagree with Thomas. While she appears to imagine a scenario in which an author offers a proof of a simple, uncontroversial claim, I take it to be essential to the early language of proof to address *primarily* "difficult, uncertain, or controversial" claims. It is not until centuries later with the philosophical and mathematical formalizations of proofs that the language of proof begins to be ubiqui-

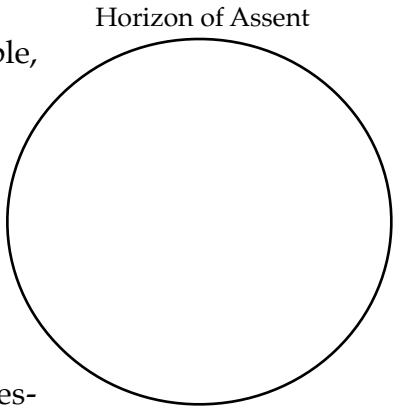
[8] As just one preeminent example, see Lloyd, 1966.

[9] See, for example, Pender 2005.

[10] Thomas 2000, 198.

tous in the persuasive discourses. At the early point in the history of proof language in which Herodotus and the author of *AWP* are utilizing these terms, however, proofs are not a necessary part of persuasion and thus used for more limited reasons. What these limited reasons might be is the topic of the first part of this paper. In order to explain why the language of proof primarily addresses controversial claims, let me first turn to define the horizon of assent.

The horizon of assent represents the perceived limits of swift agreement between writer and reader or speaker and audience. If a claim lies within the horizon of assent, no demonstrative proof is needed; if, however, an author believes a claim lies outside of the horizon of assent, he offers proof that the reader/auditor ought to re-adjust his or her horizon such that it now includes this claim. For example, if I were to state that George Washington was the United States' first president, I feel no compunction to add a proof that this is true. I believe that every reader would readily agree that yes, Washington was indeed our first president, without any further argumentation. I therefore take this claim to lie well within both my and my audience's horizon of assent. If, however, I were to state that George Washington was our best president, I immediately feel compelled to add support for this claim. Even though I myself assent to this proposition, I consider it necessary to provide arguments whenever I state this claim because I do not expect every reader to

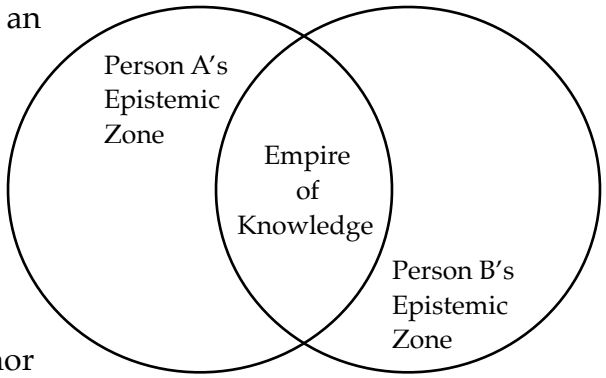


agree with me swiftly. This claim thus stands outside of my audience's horizon of assent as I perceive it.

There are a few points of interest that relate specifically to the language of proof. First, insofar as this picture accurately represents an author's state of mind when writing some form of persuasive text, proofs will necessarily crop up at those spots where a particular claim lies within the author's horizon of assent but outside of the audience's. If an author would not assent to the claim, why would he or she attempt to prove its validity; and, if an author believes the audience would readily accept the claim, why would he or she waste the time and space to prove it? The language of proof thus marks liminal spaces in the audience's epistemic horizon. Second, for the purposes of the scholar, all that is of importance – indeed all that is available – is the author's perception of his audience's horizon of assent. Unfortunately but necessarily, a text is mediated by an author, so that studying the proof language in any particular text can only provide access to the author's assumptions of that horizon. Third, the method of the argument and the type of proof have little bearing on a study of the horizon of assent. The fact that an author states a particular argument or piece of evidence as a "proof" is sufficient to assume that the claim under discussion, as stated above, lies within the author's horizon of assent but outside of the audience's.

If the horizon of assent represents the limits of ready agreement, I call the area within those boundaries one's "epistemic zone." Each individual has his or her own

epistemic zone, or, to put it in less imagistic terms, the set of propositions that someone believes himself or herself to know. Whenever an author attempts to persuade an audience, however, there will be some overlap between epistemic areas – a common zone. I designate this common zone with the phrase "empire of knowledge." I use imperial language to describe the area within two people's horizons of assent, because under this imagery, any attempt at persuasion becomes an attempt to "annex" some part of your audience's epistemic zone such that the area of common knowledge is larger once the audience has been persuaded. When an author tries to prove a claim, he or she wants the members of the audience to re-adjust their horizon of assent so that this claim is now a part of their shared "knowledge;" that is, it is a proposition both parties would readily assent to.[11] Within this imperial metaphor, the language of proof thus indicates "battleground areas" where an author attempts to expand that empire.



The conceptual models of the horizon of assent and the empire of knowledge may help to illuminate specific aspects of what Philip van der Eijk calls the grammar of scientific discourse, which he defines as the "system of rules and conditions pertaining

[11] I am not here concerned with objective epistemology, where knowledge must have some relation to truth. For the purposes of this paper, knowledge merely designates the set of propositions to which a rational agent will unreflectively assent. This "psychological" account of knowledge is merely concerned with what a person *believes* he or she knows, not with whether or not he or she *actually* knows some proposition.

to the possibilities that are available to the users of scientific language in order to present knowledge in a certain way, with a certain purpose, and for a certain audience."[12] As van der Eijk himself points out, new critical apparatuses are one necessary facet of making formal studies of the complexity of ancient scientific writings both more plausible and more palatable: "the apparent lack of an appropriate theoretical apparatus has possibly made researchers hesitant to approach ancient scientific writings from a formal point of view."[13] I believe the horizon of assent may provide one such theoretical apparatus. By properly contextualizing the "certain purpose" inherent in any use of the language of proof, the horizon of assent offers a clear and simple model by which to consider the "grammar of proof," conceived of as a sub-set of the grammar of scientific discourse at large. As noted at the beginning, Rosalind Thomas' distinction between rhetorical and simple proof language, although left implicit and roughly defined in her text, makes an initial step in the right direction. It offers a critical apparatus for distinguishing and classifying the ways in which an author presents knowledge. I hope that I have demonstrated how the horizon of assent and the empire of knowledge might similarly function to aid us in finding and describing the argumentative purposes and epistemic battlegrounds for particular texts.

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[12] van der Eijk 1997, 82.

[13] ibid., 80.

II. The Language of Proof in *AWP*

In order to offer an example of how the horizon of assent can aid our reading and understanding of a text, I turn now to *Airs, Waters, Places*.[14] As I stated at the outset, for a number of reasons *AWP* functions well as a general representative for the burgeoning medical/scientific discourse in the latter half of the fifth century. A consideration of its use of the language of proof may thus provide an initial suggestion of the key battle-ground areas between this scientific discourse and traditional assumptions and beliefs. Indeed, as I shall argue, the proofs in *AWP* cluster around a particular theme—natural operations, such as processes and states. By consistently offering proofs for his accounts of specific natural operations, the Hippocratic author signals his attempt to annex aspects of the natural world into the "empire of knowledge." He therefore furthers the project of Ionian natural science to determine what nature *is* by offering specific accounts of how nature *works* in particular scenarios.

Following Thomas' lead, let us begin by briefly describing the argumentative context, type of claim, and kind of proof for the six instances of τεκμήρια in *AWP*. Let me note at the outset, however, that the following analysis shall take no account of the truth or falsity and the rationality or irrationality of the claims and proofs; I shall merely describe what the Hippocratic author perceived to be rational and evidently thought to be true. As the title suggests, *AWP* covers three natural entities: air, water, and locale. Of

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[14] I use Jouanna's Boude text throughout.

the six uses of proof language, three concern water. This is the first major argumentative context in which proof language appears. First, when discussing rain water (ὁμβρίων, 8.1), the Hippocratic author claims that "the sun raises and draws up the finest and lightest part of water" (ὁ ἥλιος ἀνάγει καὶ ἀναρπάγζει τοῦ ὕδατος τό τε λεπτότατον καὶ κουφότατον, 8.3).[15] As "the greatest proof" (τεκμήριον δὲ μέγιστον, 8.4) the author offers a quasi-experiment—whenever you walk in the sun, you only sweat where your clothes are covering the skin. The explicit explanation for this phenomenon is that any sweat on the bare skin "disappears because of the sun" (ἀφανίζεσθαι ὑπὸ τοῦ ἡλίου, 8.4). The claim clearly concerns a natural process, evaporation, and the author offers an empirical proof.

Discussing the next type of water, water from snow or ice (τὰ δὲ ἀπὸ χιόνος καὶ κρυστάλλων, 8.9), the Hippocratic author again turns to a quasi-experiment to prove that previously frozen water is inherently harmful. While his larger claim is that ice water is harmful (a natural state), this proposition rests upon a central claim that freezing removes the lightest and finest parts of water (a natural process). As proof, the author suggests this experiment: Measure water, then freeze it, then thaw it, then measure again. Some water will be gone, and of course, it is the finest portion of the water, leaving behind the heaviest and least healthy parts. This is also an empirical proof that could be tested by anyone in the audience.

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[15] The Greek text is that of Jouanna

The third use of τεκμήριον in the passage on water concerns the formation of gallstones. Although not a meteorological phenomenon, gallstone formation is a natural process invisible to the human eye, thus falling in line with the previous two examples. Following directly on the discussion of unhealthy snow water, the author here describes one possible consequence of ingesting bad water. The claim of which he offers proof is that gallstones are formed from the thickest parts of urine, which back up in the bladder due to inflammation (τὸ μὲν λεπτότατον αὐτοῦ καὶ καθαρώτατον διιεῖ καὶ ἐξοθρεῖται, τὸ δὲ παχύτατον καὶ θολωδέστατον ξυστρέφεται καὶ συμπήγνυται, 9.4). This claim concerns a natural process. The proof offered is that urine from those with gallstones is clear (τὸ γὰρ οὖρον λαμπρότατον οὐρεουσιν οἱ λιθιῶντες, 9.5). This is once again an empirical proof of an invisible process, which, like the others, requires certain prior assumptions (e.g. that the thick portion of urine makes it dark).

AWP notoriously includes a fourth section loosely connected to the topic of places—ethnography. In this section, the final three proofs appear. As the Hippocratic author of *AWP* compares and contrasts Asiatic from European peoples, he examines the cowardice of the Asiatics. The chief reason for this discrepancy is the lack of the violent seasons in Asia. As the author argues, "when everything changes, it goads men's temperament and does not allow them to settle down" (αἱ γὰρ μεταβολαί εἰσι τῶν πάντων αἱ ἐπεγείροθσαι τὴν γνώμην τῶν ἀνθρώπων καὶ οὐκ ἐῶσαι ἀτρεμίζειν, 16.2). A secondary cause, however, of Asiatic cowardice is their form of government.

The Hippocratic author claims that despotic rule in particular contributes to forming cowardly citizens. The author goes so far as to state that even a naturally brave man will become cowardly if he is born within a despotic society (καὶ εἴ τις φύσει πέφυκεν ἀνδρεῖος καὶ εὔψυχος, ἀποτρέπεσθαι τῆν γνώμην ὑπὸ τῶν νόμων, 16.4). As proof he offers the observation that all Asiatic peoples not ruled by a despot are the most warlike (οὗτοι μαχιμώτατοί εἰσι πάντων, 16.5). This is technically an empirical proof, if quite difficult to demonstrate definitively. Nonetheless, this proof follows the established pattern to offer an empirical (in a broad sense) proof for a claim concerning some invisible process or state.

Next follows Thomas' chosen example—the self-cauterized Scythians. The author claims that all Scythians are "plump, fleshy, jointless, wet, and flabby" (τὰ εἴδεα αὐτῶν παχέα ἐστὶ καὶ σαρκώδεα καὶ <ἄν>αρθρα καὶ ὑγρα καὶ ἄτονα, 19.5). This claim concerns a natural state. As proof of their moistness, the author points to the fact that nomadic Scythians cauterized their shoulders, arms, wrists, breasts, hips, and loins. This proof is technically "empirical," though only a small number of people would have the actual experience to "check" the author's facts. Like the ice-water example, this proof concerns both a natural state and a process; the overarching claim is that Scythians are naturally moist (state), but the sub-claim is that heating removes moistness (process).

Just as the author moved from a proof of snow water being unhealthy to a proof of one consequence of drinking such water, here he moves from the Scythians moist constitution to one necessary consequence—they are infertile. To "prove" that moist and flabby constitutions lead to infertility, the author merely points to the example of the Scythians' slave women. The author reports that Scythian slave women are remarkably fertile (οὐ γὰρ φθάνοθσι παρὰ ἄνδρα ἀφικνεύμεναι καὶ ἐν γαστρὶ ἴσχουσιν, 21.3) directly because of their "hard work and their bodies' leanness" (διὰ τὴν ταλαιπωρίην καὶ ἰσχνότητα τῆς σαρκος, 21.3). Once again, the claim concerns a natural state while the proof relies upon an implicit sub-claim concerning a natural process—here, the process of impregnation. Thus, the six proofs in this text each concern a natural process in some way, either as relating to the claim or relating to the proof, and some also relate to natural states.

We can summarize these findings with a simple chart displaying the argumentative context, type of claim, and kind of proof for each of the six τεκμήρια in *AWP.* As we saw above, there are two larger contexts in which the language of proof is used: the discussion of water and the ethnographic section. There are three proofs offered in each of these contexts. The claims of which the author offers proofs concern two general classes: natural processes and natural states. All of the proofs offered are themselves generally empirical insofar as each points to a visible phenomenon. We can distinguish two kinds of empirical proofs, however: deictic and experimental. Sometimes the author merely

points to a known fact or a visible situation (deictic proof), other times he suggests performing an experiment of sorts (experimental proof). Below is the summary chart:

Claim	Argument Context	Type of Claim	Kind of Proof
Sun evaporates sweat	Water	Process	Experimental
Ice-water is harmful	Water	State	Experimental
Gall stones formed from thick urine	Water	Process	Deictic
Scythians are moist	Ethnography	State	Deictic
Scythians are infertile	Ethnography	State	Deictic
Nomoi affect character	Ethnography	Process	Deictic

I believe this analysis of the proof language in the text allows us to assert confidently that the author of *AWP* consistently provides proofs to defend his own account of certain natural operations. Many of the proofs depend upon a natural process, although this process is generally kept implicit and hid beneath the veneer of a simple empirical proof. For example, the claim that ice water is harmful concerns a natural state and the offered proof consists of an experiment, but lurking behind both is the belief that evaporation removes the best/healthiest portion from the water. Therefore, even claims about natural states in a way also concern natural processes. Using the model of the horizon of assent, we might ask if this text thus provides insight into a larger "battleground area" between the burgeoning scientific discourses and the common established views of an average Greek? In what follows, I wish to conclude by con-

sidering why we might be able to answer yes to this question and construct an image of the intellectual currents moving at the time of the writing of *AWP*.

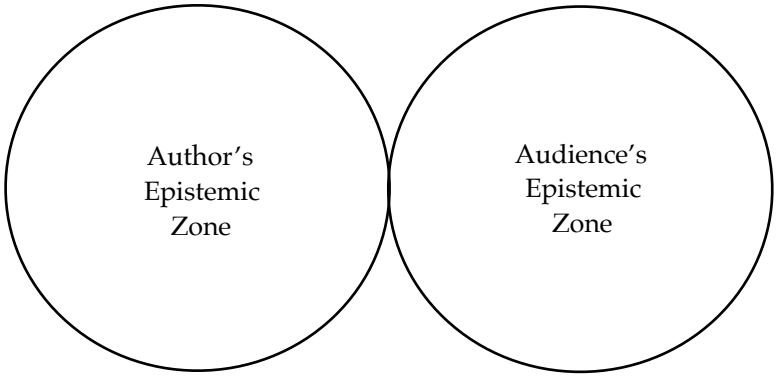
III. An Intellectual Moment

G.E.R. Lloyd's landmark study on argumentation in early Greek thought placed analyses of argument, evidence, and proof in the ancient world on surer historical and logical grounds. In his conclusion, Lloyd notes that it is not until the sixth and fifth centuries that "a rich vocabulary of terms to refer to the use of evidence" begins to develop in both prose and poetry.[16] Unfortunately, Lloyd pays little attention to the proof language in the *Hippocratic Corpus*, and particularly in *AWP*. Nonetheless his study of argumentative methods clearly links the Hippocratics with Ionian *physiologoi* in their shared use of arguments from analogy or polarity. One might ask if the commonalities go deeper, however, when the argumentative purpose is studied.

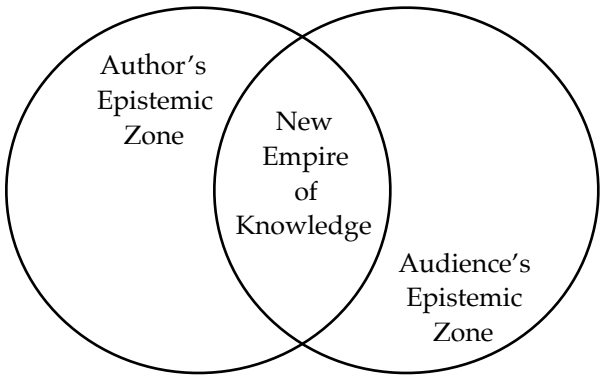
In the second section of this paper, I attempted to explicate how every proof offered in *AWP* takes aim at some aspect of the natural world, and most specifically, natural processes. Using the critical apparatus of the horizon of assent, we might say that the Hippocratic author of *AWP* evidently believed that certain explanations of natural phenomena would lie outside of his audience's horizon. It would appear, for instance, that he believed his account of evaporation would require epistemic support in the form

[16] Lloyd 1966, 426-7.

of an experimental proof. The language the author uses suggests that his persuasive purpose in that section of the text was to "annex" a portion of his audience's epistemic zone, specifically that portion concerning the natural process of evaporation. The situation may be clarified with the aid, once again, of Venn diagrams. At the moment of speaking or writing, the author would appear to have believed the epistemic situation relative to evaporation to be something like this:



The author hopes, however, after his explanation and proof, to have created a new "empire of knowledge" relative to evaporation, which we can represent thus:



The argumentative purpose of the proof concerning evaporation was thus to have the audience re-adjust their horizon of assent so as to create this common epistemic zone, this empire of knowledge. In this way, a study of "the where" of proof language, that is,

those topics where the proofs appear to pop up consistently, reveals an epistemic battleground area. In *AWP,* this battleground squarely centers upon the workings of the natural world, its processes and its states.

This consistent focus on the natural world links the Hippocratic author of *AWP* with the *physiologoi.* Gregory Vlastos summarizes the major topics of interest to the early Greek natural philosophers thus: "the creation of the world, the necessity of its order, the origin of life, the nature of the soul, and even such things as the causes of winds, rain, lightning and thunder, rivers, meteorites, eclipses, earthquakes, [and] plagues."[17] The three proofs concerning water would fit nicely in the last category. Just as the *physiologoi* are interested in explaining the various workings of the natural world in a materialistic manner, the Hippocratic author of *AWP* offers three proofs concerning three natural processes—evaporation, freezing, and coagulation. The latter three proofs, however, do not appear to fall in line neatly with the interests of the *physiologoi.*

The three ethnographic proofs might suggest one of the more unique contributions of the medical discourse to the larger "scientific" discourse incipient at that moment in intellectual history. These proofs in *AWP* adumbrate what is explicit in *On the Nature of Man*—that the human being is as much subject to natural forces as water or any other simple natural entity.[18] When the Scythians are described as moist, they are

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[17] Vlastos 1996, 3.

[18] I make no claims as to dating. Whether *AWP or DNH* was written first makes little to no impact on the general claims made here.

described in a similar manner as locales. To put it differently, while the Ionian *physiologoi* were interested in the nature of the soul (the rational part of humanity), the Hippocratics are more interested in the nature of the body (the animal part). In this way, the Hippocratic author of *AWP* both follows the trend of the natural philosophers, but also extends it toward new horizons.

Although these concluding thoughts are sparse and general, I hope they have suggested at least one way in which a study of the language of proof such as this may help to place texts and authors in their larger intellectual environments. While studies of methodological similarities are equally fruitful, they are not exhaustive. Authors may very well utilize differing methods, but aim to persuade people of the same types of things. Contrarily, authors using the same methods may have very different epistemic goals. In order to gain a fuller picture of the intellectual milieu burgeoning in the sixth and fifth centuries, both methods and persuasive goals must be taken into account. While studies such as Lloyd's and others'[19] have done much to elucidate the methodological threads uniting various intellectual strands of early Greek thought, and Thomas' analysis and others'[20] have done much to focus much needed attention on the "rhetorical" elements to these methodological issues, this paper has attempted to illu-

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[19] Lloyd 1966. For other eminent examples, see Vlastos 1996 as well Wittern and Pellegrin (eds) 1996.

[20] Thomas 2000. See also Thomas 1998, Lateiner 1986, Pender 2005, and van der Eijk 1997.

minate how both rhetorical and methodological elements might fit into an epistemic context.

This epistemic context centers on the horizon of assent—a person's boundary beyond which he or she will not readily assent to a proposition. As previously stated, persuasion is pictured as "annexing" epistemic ground; that is, of having one's audience readjust their horizon of assent to include the persuaded claim. Insofar as the language of proof points to the areas where an author is attempting to annex his audience's horizon of assent, it yields insight into the persuasive goals of the author as well as perhaps the text's larger intellectual climate. A text such as *Airs, Waters,Places* that consistently uses proof discourse reveals an epistemic battleground area where the author's view of the world and his audience's clash concerning the machinations of the natural world. As the title to this paper suggests, I believe that a careful study of the language of proof used within a text, when coupled with a clear and concise theoretical apparatus, helps to put a text in context.

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