Evidence and Inference in Herodotus

0. Introduction

While Herodotus can justifiably be called a garrulous story-teller, he is not without his engagement with philosophy.[1] He demonstrates a familiarity with rational argumentation, whether arguments from probability (εἰκός)[2] or arguments from necessity (ἀνάγκη),[3] he utilizes the language of proof (τεκμήρια and μαρτύρια),[4] and he is often concerned with inferring the unknown from the known.[5] Yet these are not novel philosophical advancements. As Rosalind Thomas[6] and Donald Lateiner[7] have demonstrated, Herodotus shares much philosophically with contemporary Hippocratic doctors.[8] In each of these three areas Thomas and Lateiner sense that Herodotus and the Hippocratics share a common empirical methodology. Thomas is quick to point out, however, that "these methods are more obvious and more overt in the sections treating geography,

[1] For early studies of Herodotus' relation to philosophy, see Nestle 1908, Pohlenz 1937 and 1963, and Dihle 1962: 207–220.

[2] See Müller 1981: 307; cf. Lateiner 1989: 193.

[3] See Thomas 2000: 175-90 for a thorough analysis of Herodotus' use of argument. For an analytical typology of Herodotus' various argumentative forms, see A. Lloyd 1975: 141.

[4] See ibid.: 190-200 on Herodotus' use of these and similar proof terms.

[5] See ibid.: 200-11 and Corcella 1984.

[6] Thomas 2000.

[7] Lateiner 1986.

[8] Lloyd 1966: 425-30 also compared Herodotus' method with that of the Hippocratics.

customs, ethnography (and throughout Book II), rather than the narratives of past events;"[9] that is to say, Herodotus qua historian is only empirical insofar as he uses evidence over and against abstract theorizing (although he does that as well).[10] If "empirical" is defined more strictly as the use of sensory and observable evidence, Herodotus' treatment of the past is clearly not "empirical."

This interweaving of strictly empirical moments (where sensory evidence is used) with more general empirical elements (where any kind of evidence is used) add a further layer of complexity to an already complex text. More pertinently for our purposes, this also complicates the epistemic relationship between Herodotus and the Hippocratics. Although the work of Thomas, Lateiner, and others has done much to show the philosophical similarities that unite Herodotus and the Hippocratics, complications such as this demonstrate that more remains to be done to determine in what ways and to what degree Herodotus is "empirical" in the ways that the Hippocratics are. This paper is an initial foray in such a direction.

In order to illuminate where and how Herodotus is empirical, I focus upon the relation of evidence to inference in both Herodotus and the Hippocratic treatise *Airs*,

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[9] Thomas 2000: 172.

[10] Corcella 1984: ___.

Waters, Places. In both texts I examine instances where the author offers "evidence" (τεκμήρια) and explicitly states that he is "inferring" (τεκμαίρομαι). In analyzing these selections of passages I ask four interrelated questions:

- what are the types of evidence offered?
- what are the types of inferences used?
- what are the types of conclusions reached?
- how is the reasoning displayed?

Guided by these questions I aim to stress the ways in which Herodotus departs from the Hippocratics, or specifically the Hippocratic author of *Airs, Waters, Places* (*AWP*). In particular, I argue that the answers to the first and fourth questions articulate differences between the epistemologies of Herodotus and the Hippocratic author of *AWP*. First, I argue that evidence in Herodotus is of variable types, while in *AWP* it is consistently empirical/observable. Second, I contend that Herodotus presents inferential reasoning as providing reasonable opinion, contrary to the Hippocratic author's position that inference can provide assent-worthy knowledge. Second, In short, while both the Hippocratics and Herodotus share certain empirical elements, there are important points of divergence.

Of course, *AWP* is only one of the myriad of Hippocratic texts.[11] One might rightly ask why I have chosen this single text to stand in for the whole collection. I have chosen this treatise primarily for two reasons. First, Thomas categorizes this treatise within a select group of Hippocratic treatises that utilize what she calls "the rhetoric of proof."[12] Within this group, however, *AWP* appears more centrally situated within the spectrum between "rhetorical" and "scientific" proof language.[13] Second, *AWP* uses the term τεκμήρια ("proof/evidence") six times throughout the work, more than any other Hippocratic text.[14] This treatise therefore offers both the most quantitative material for study and a well-rounded qualitative selection of proofs.

There is, however, another reason that I have chosen *AWP* as my comparandum with Herodotus. This text is frequently thought to share a number of similarities with Herodotus, and is often dated roughly contemporaneously with the *Histories.* Some, like Max Pohlenz, have argued that the *Histories* influenced the author of *AWP*, while other,

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[11] List of all texts?

[12] Thomas 2000: 199-200; the other Hippocratic texts include *On the Art* (Gk. title?) and *On Ancient Medicine* (Gr. title?).

[13] ibid. 197.

[14] TLG statistics?

such as Wilhelm Nestle, have argued that *AWP* influenced the *Histories*.[15] Thus, not only does *AWP* offer fertile ground for study of the use of evidence in the Hippocratic tradition, it is also culturally and intellectually of a kind with Herodotus' *Histories*.

One might also justifiably ask why this study confines itself to τεκμήρια and τεκμαίρομαι. There are numerous terms used in Greek for "evidence": τεκμήριον, μαρτύριον, and σημεῖον just to name the most prevalent. Thomas distinguishes these three terms by their degree of implied decisiveness. A τεκμήριον is the most decisive form of proof;[16] a μαρτύριον is less decisive, yet still stable grounds for inference;[17] and a σημεῖον is merely a sign. Since I am not only interested in *what* Herodotus uses as evidence but *how* that evidence is used in inferences, I incline towards that pieces of evidence that Herodotus classes as the most decisive. I am also interested in the connotational relationship between the noun τεκμήρια and the verb τεκμαίρομαι, as both derive from the root τεκμ-.[18]

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[15] Nestle 1908 and Pohlenz 1937]. In the most recent critical edition of *AWP*, Jacques Jouanna dates the treatise (following Heinimann 1945) to shortly after 430.[^Jouanna 1996: 82, "On pourrait donc situer le traité des *Airs*, *faux*, *lieux* à la transition entre Hérodote et Thucydide."

[16] Aristotle later formalizes this definition of τεκμήριον as conclusive proof that if formally valid, see *Prior Analytics* B 27 and *Rhetoric* 1356b7-10.

[17] Thomas 2000: 191 states that, in Herodotus, they "tend to be the kinds of evidence that are tangle, visible or the kind of evidence that might be presented in the law-courts."

[18] This root comes up once in Homer at *Il*. 1.525-7, when Zeus nods his head in assent to Hera's wishes, the μέγιστον τέκμωρ.

Herodotus uses a fair number of verbs that we might translate as "infer": τεκμαίρομαι, συμβάλλειν, νοέειν, εἰκάζειν.[19] In the burgeoning scientific discourses of the so-called Greek enlightenment, τεκμαίρομαι takes on a more specific, 'scientific' connotation. Scholars typically see Alcmaeon of Croton as one of the thinkers initiating this change.[20] In a fragment Alcmaeon discusses the necessity of inference for mortals, as opposed to the divine ability 'to know':

> περὶ τῶν ἀφανέων, περὶ τῶν θνητῶν σαφήνειαν μὲν θεοὶ ἔχοντι, ὡς δὲ ἀνθρωποις τεκμαίρεσθαι καὶ τὰ ἑξῆς…
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> DK 24, B 1

> The gods have clear know of human matters, but so far as humans may infer about unseen matters…

Inference is the epistemic lot of mankind. This connotation within the intellectual trends of 6th and 5th century Greece add extra weight to Herodotus' uses of this verb over and against other alternatives.

More pragmatically, the related τεκμήρια and τεκμαίρομαι occur twelve times combined in the *Histories*, more than μαρτύριον and its related verb (ten times). Thus, just as I chose *AWP* because it contained the most uses of τεκμήρια in the Hippocratic corpus, I have chosen to concentrate on these two τεκμ- words for similarly quantitative

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[19] Lateiner 1986: 11 offers a concise summary of Herodotus' uses of these verbs.

[20] On Alcmaeon, see Wachtler 1896. For the intellectual history of this use of τεκμαίρομαι, see Lloyd 1966 and Corcella 1984.

reasons. While this choice is certainly arbitrary to some extent and will necessarily limit the scope of any conclusions concerning Herodotus' overall understanding and use of evidence and inference, I do believe that these terms offer the richest, most representative sample both for Herodotus and the Hippocratics.

Before finally turning to the actual passages in the *Histories* and *AWP*, I wish to expound a bit more on my methodology in examining these selections. As I stated above, I am interest in four inter-related questions. Three are typological:

- what are the types of evidence offered?
- what are the types of inferences used?
- what are the types of conclusions reached?

The fourth focuses on manner:

- how is the reasoning displayed?

While these questions in and of themselves offer clear guidance, I believe that we may also clarify the kinds of answers we might sense on our texts. In what follows, I wish briefly to consider in the abstract how one might answer these questions. Hopefully this exercise will provide clearer, more rich insight into the thinking of Herodotus and the Hippocratic author of *AWP*.

First, let us consider what types of evidence one might offer. As noted above, there is some confusion in defining "empirical," particularly in the classical world. Does the distinction lie in using evidence (versus abstract theorizing) or in using specifically sensory evidence? This question offers us an initial answer to our question, as sensory evidence is clearly a species of the genus 'evidence'. Under sensory evidence, we can discern two primary types: (1) observed and (2) testimonial. The sensory evidence may either be first-person ("I saw") or third-person ("X saw"). If sensory evidence is our first type, the second species of evidence would naturally be abstract evidence. Here I believe we can again distinguish two versions: (1) logical and (2) analogical. In overly simplistic terms, we might say that logical evidence points to a necessary fact as evidence for the claim; analogical evidence, to a contingent fact. The probable (τὸ εἰκός) is a standard example of logical evidence, while Herodotus' famous argument based on the similar lengths of the Ister and Nile (a passage I will discuss below) is a stock example of analogical evidence. In brief, I believe we can say that there are four kinds of evidence Herodotus and the author of *AWP* are likely to offer: observed, testimonial, logical, and analogical.

Turning to the second question, what are the types of inferences, I follow the erudite analysis of James Allen.[21] Allen focuses upon four areas when classifying the types of inferences: the inference's rhetorical end, conclusion, justification, and force:

> "Inferences and the grounds on which they are based can be distinguished into kinds according to several different principles. One can, for example, oppose inferences that serve the purpose of theory construction, e.g. in natural philosophy, to those serving more quotidian ends, e.g. in the law courts. It is also possible to distinguish inferences with conclusions that cannot be confirmed by observation from those whose conclusions are about matters that are not in principle unobservable, but which must be established by inference owing to contingent circumstances that prevent direct observation. These two divisions will tend to coincide. But inferences can also be divided into kinds according to the nature of the warrant they furnish: for example, is the principle on which the inference rests an empirically established correlation between sign and signified or a necessary relation of consequence imposed by the nature of the matter at issue and grasped by a special faculty of reason distinct from experience? We shall find some ancient figures who suppose that this distinction too coincides with the previous two. Lastly, it is possible to distinguish evidence which provides conclusive support for a conclusion from evidence which merely serves to make a conclusion likely or probable."[22]

Let us break down these distinctions. Allen begins by distinguishing inferences that aim at theoretical ends from those that aim at less philosophically lofty goals. This distinction parallels the distinction in conclusions. An inference can lead to a conclusion that is

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[21] Allen 2001.

[22] ibid.: 6.

metaphysically unobservable,[23] or to a conclusion that merely happens to be unobserved.[24] Allen points out that an inference that aims at establishing an abstract theory will also likely lead to an unobservable conclusion, while a more quotidian inference will similarly likely lead to a non-observed conclusion. The final two distinctions rest upon the inference's justification and its epistemic force. The difference between "an empirically established correlation" and "a necessary relation of consequence" mirrors our earlier classification of abstract evidence as either analogical or logical. Finally, Allen distinguishes inferences that provide support for a necessary conclusion and those that support a probable conclusion. We can summarize these points with a simple chart:

- Ends
  - Theoretical
  - Quotidian
- Nature of conclusions
  - Unobservable
  - Non-observed
- Justification
  - Contingent
  - Necessary
- Force
  - Necessary
  - Probable

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[23] For a famous example, consider Aristotle's beginning to the *Metaphysics*: "All men by nature desire to know" (πάντες ἄνθρωποι τοῦ εἰδέναι ὀρέγονται φύσει, *Met*. 1.980a). This conclusion is reached from the inference that humans esteem the senses, and in particular the sense of sight.

[24] We will see an example at *AWP* 9.

Allen's distinction between inferences based upon the nature of their conclusions leads naturally to our third question, the kinds of conclusions reached. While the distinction between conclusions that are impossible to observe and those that simply have yet to be observed is valuable, I believe we can add a further specification. There must also be conclusions that are observed, and the arguments merely strengthen one's confidence in an observed conclusion. This would lead to a tripartite distinction in the types of conclusions that inference could produce: non-observed but observable, non-observed and unobservable, and observed. The primary distinction is between observed (previously known) conclusions and non-observed (novel) conclusions. Under non-observed, however, we may specify those that may be observed and those that are utterly unobservable.

The final area of consideration is how the inferential reasoning is displayed. The first point to be made on this topic follows Allen's distinction between two types of argumentative force: does the inference lead to a necessary or probable conclusion? On this point, G.E.R. Lloyd offers some historical context:

> "the Presocratic philosophers commonly distinguish between knowledge and mere opinion (e.g. Xenophanes Frr. 34 and 35 and Parmenides Frr. 1 28 ff. and 8 50 ff.) and here we should note that the former is generally associated with reason and intuition, the latter with sensation, and the difference is a difference in kind between two types of cognition. With this idea we may contrast that of the historians, for example, when they point out that the evidence available to them on a particular question does not allows certain conclusions to be drawn (e.g. Hdt. 1 57 and Th 1 1) for here the difference between certain and merely probably conclusions is clearly only one of degree. In this context, a probability could

> become a certainty given additional evidence, whereas for Parmenides no amount of additional empirical data would allow an opinion about what is likely (ἐοικότα, Fr. 8 60) to be converted into a conviction which is true (πίστις ἀληθής, Fr. 1 30; πιστὸν λόγον … ἀμφίς ἀληθείης, Fr. 8 50f.).[25]

Lloyd is concerned with epistemology more generally, not specifically inferential conclusions, but his point remains salient for our consideration of Herodotus. Herodotus offers conclusions reached via inference that are presented as reasonable opinion and not secure knowledge. I shall argue below that this is a point of departure between Herodotus and the Hippocratic author of *AWP*: the former presents inferential conclusions as reasonable opinion, the latter as assent-worthy knowledge. However, there remains another way in which we might classify the manner in which inferences are presented. The inferential argument may either be explicitly laid out or it may be an enthymeme.

With these analytical tools and distinctions in mind, I now wish to turn to the passages in the *Histories* and *AWP* that deal with "evidence" (τεκμήρια) and "inference" (τεκμαίρομαι). As noted above, I hope to demonstrate that while Herodotus and the author of *AWP* do share certain epistemic values (as Thomas and Lateiner have shown), there are important ways in which they differ. First, inferential reasoning is presented as reasonable opinion in Herodotus, but as assent-worthy knowledge in *AWP*. Finally, evidence in Herodotus is of variable types, while *AWP* consistently uses only empirical/observable types

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[25] Lloyd 1966: 425.

of evidence. In these three ways, I believe we can sense that Herodotus is not empirical in the strict sense (rely on sensory evidence), but only in the more general sense.

1. Evidence and Inference in *AWP*

If strict empiricism relies upon sensory evidence in particular as the foundation for inferential reasoning, the author of *AWP* offers a clear example of a strict empiricist. *AWP* speaks of τεκμήρια six times throughout the treatise, each of which may be classed as sensory. Although, however, each of the proofs offered is empirical insofar as it points to a visible phenomenon, we can distinguish two kinds of empirical proofs: what I will call deictic and experimental. Sometimes the author merely points to a known fact or a visible situation (deictic proof), and other times he suggests performing an experiment of sorts, whether actual or mental (experimental proof). Of the six τεκμήρια, two are experimental and the rest are deictic. As another point of organization, as the title suggests, *AWP* covers three topics: air, water, and locale. Of the six uses of proof language, three concern water and three concern location. Let me note at the outset 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 Hip-

pocratic author perceived to be rational and evidently thought to be true. Let us begin with the water-related instances.

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). 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 proof offered is in the form of a thought experiment, although it is clearly also observable evidence. The inference on display is theoretical (the author is concerned with the theory of evaporation) and the force of the inference is necessary. The author aims to demonstrate a universal natural process. He does not wish to show that the sun *probably* evaporates water, but that the process of evaporation affects everything: For the sun raises up water "from whatever has moisture in it—and there is moisture in everything" (ἐξ ἁπάντων ἐν ὁκόσοισιν ὑγρόν τέ ἐστιν· ἔνεστι δὲ ἐν παντὶ χρήματι, 8.3).

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, this proposition rests upon a central claim that freezing removes the lightest and finest parts of water (ὑπὸ τῆς πήξιος ἀφανίζεται καὶ ἀναξηραίνεται τὸ κουφότατον καὶ λεπτότατον, 8.11). 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 experimental piece of evidence, though the language suggests this is an actual experiment, not merely a mental one. The evidence is once again clearly observable (εὑρήσεις), and the inference is attempting to prove a necessary conclusion about a theoretical topic. Just as the sun evaporates the "lightest and finest part" (λεπτότατον καὶ κουφότατον, 8.3) of water, freezing also removes "the lightest and finest part" (κουφότατον καὶ λεπτότατον, 8.11).

The third use of a 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). 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.

Taking these three water-proofs as a group, we can note certain consistencies in the author's use of evidence and inference. First, the justification/evidence for each of the inferences above is empirical in the strict sense. The author turns to sensory evidence to support his claims. Second, these inferences aim to demonstrate theories about non-observed natural processes. Third, the inferences also support knowledge. The author never "hedges his bets," so to speak. The sun *does* evaporate sweat; freezing *does* remove the finest portion of water; gallstones *are* formed by a build up of the thickest parts of urine. These claims are not likely the case, the author of *AWP* presents them as certainly true and fully proven by the offered τεκμήρια.

AWP notoriously includes a fourth section on ethnography loosely connected to the topic of places. In this section, the final three proofs appear. As the Hippocratic author compares and contrasts Asiatic from European peoples, he examines the cowardice of the Asiatics. The chief reason for this discrepancy, to his mind, is the lack of the vio-

lent 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. The inference also leads to a necessary conclusion. The hypothetical, "even if a naturally brave and spirited man is born his tempter is changed by their institutions," is not probable, it is simply true.

Next follows the example of 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 αρθρα καὶ ὑγρα καὶ ἄτονα, 19.5). As proof of their moistness, the author points to the fact that nomadic Scythians cauterized their shoulders, arms, wrists, breasts, hips, and loins (εὑρήσεις κεκαυμένους τούς τε ὤμους καὶ τοὺς

βραχίονας καὶ τοὺς καρποὺς τῶν χειρέων, καὶ τὰ στήθεα, καὶ τὰ ἰσχία καὶ τὴν ὀσφὺν, 20.1). This proof is technically "empirical," though only a small number of people would have the actual experience to check the author's facts. Nonetheless, the author points to an observable fact as his evidence. The inference itself is this time more quotidian. The author is not overly concerned with a grand anthropological theory, but with demonstrating the natural "moistness" (ὑγρότητα) of the Scythians. While the end changes, however, the force remains necessary. There is no hint of probability in this section. The Scythians are moist because they do cauterize.

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). This deictic evidence is simple and direct. The observable fertility of the slave women, who sleep with the same Scythian men as Scythian

wives, proves the infertility of the Scythian women (since it cannot be the men's fault, as they are common to both scenarios).

AWP clearly uses empirical evidence to support inferences that are presented as assent-worthy knowledge. There is never any talk of probabilities or possibilities in the inferences above. Each one uses some kind of observable evidence as justification for a claim that is presented as true. This methodology is confirmed by the final sentence, which is also the only instance of τεκμαίρομαι in *AWP*:

> Αἱ μὲν ἐναντιώταται φύσιές τε καὶ ἰδέαι ἔχουσιν οὕτως· ἀπὸ δὲ τουτέων τεκμαιρόμενος τὸ λοιπὰ ἐνθυμέεσθαι, καὶ οὐχ ἁμαρτήσῃ
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> *AWP* 24.49

> "The most opposite external form and internal constitution are like so. But inferring from these things [one can] reason out the rest without error."

For the author of *AWP*, one can infer without error; that is, use visible facts as proof of invisible processes or phenomena. This final phrase, καὶ οὐχ ἁμαρτήσῃ, makes explicit the implicit idea that *AWP* does not merely offer reasonable opinions based on observable facts; it offers secure knowledge built upon empirical evidence. This strict empiricism can be contrasted with Herodotus' use of these terms.

2. Evidence and Inference in the *Histories*

In Herodotus, τεκμήρια are indications that certain facts are likely true and reasonably believed, nothing more and nothing less. Herodotus does frequently have recourse to evidence when dealing with inferential reasoning, but the types of evidence used and the way in which the conclusions of that reasoning are presented differ from *AWP*. Herodotus frequently "hedges his bets," often using the dative of reference with first person personal pronoun (μοι) to distance the "proof" from certainty.[26]

Book 2, the excursus on Egypt, its peoples, lands, and culture, is replete with the language of proof and inferential reasoning. Of the seven uses of a form of τεκμήριον in the *Histories*, four occur in Book 2.[27] At 2.13, it is the oral evidence of a priest that supports Herodotus' view that the Nile's flooding and silt effectively created Egypt:

> ἔλεγον δὲ καὶ τόδε μοι μέγα τεκμήριον περὶ τῆς χώρης ταύτης οἱ ἱρέες, ὡς ἐπὶ Μοίριος βασιλέος, ὅκως ἔλθοι ὁ ποταμὸς ἐπὶ ὀκτὼ πήχεας τὸ ἐλάχιστον, ἄρδεσκε Αἴγυπτον τὴν ἔνερθε Μέμφιος: καὶ Μοίρι οὔκω ἦν ἔτεα εἰνακόσια τετελευτηκότι ὅτε τῶν ἱρέων ταῦτα ἐγὼ ἤκουον. νῦν δὲ εἰ μὴ ἐπ᾽ ἑκκαίδεκα ἢ πεντεκαίδεκα πήχεας ἀναβῇ τὸ ἐλάχιστον ὁ ποταμός, οὐκ ὑπερβαίνει ἐς τὴν χώρην
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> *Histories* 2.13

> "Another thing the priests told me about the land is an important piece of evidence. They told me that in the time of King Moeris the river had only to rise a minimum of eight cubits and it flooded the country north of Memphis. Now, Moeris had been dead less than nine hundred years, at the time when I was told this by the priests. Nowadays, however,

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[26] Other authors who use the τεκμήριον δ᾽ phrase along with μοι include: Antiphon (*In novercam* 10.7), Plato (*Cratylus* 398.a.6), (*Hippias minor* 372.b.4), Hippocrates (*De carnibus* 8.3).

[27] Thomas 2000: 168-212 offers a clear analysis of this and other proof terms and argumentative forms used throughout the *Histories*, though she too notes the frequency of occurrences in Book 2.

> unless the river rises a minimum of fifteen or sixteen cubits, it does not spill over on to the land."

This is testimonial evidence, a kind not used at all by the author of *AWP*. Moreover, the account of the rising of the river before it flooded is over 900 years in the past, placing it well beyond the secure historical perspective.

Later, in section 43, Herodotus claims to have many τεκμήρια, although he offers only one. Herodotus is arguing that the Greeks received the worship of Heracles from the Egyptians:

> καὶ μὴν ὅτι γε οὐ παρ᾽ Ἑλλήνων ἔλαβον τὸ οὔνομα Αἰγύπτιοι τοῦ Ἡρακλέος, ἀλλὰ Ἕλληνες μᾶλλον παρ᾽ Αἰγυπτίων καὶ Ἑλλήνων οὗτοι οἱ θέμενοι τῷ Ἀμφιτρύωνος γόνῳ τοὔνομα Ἡρακλέα, πολλά μοι καὶ ἄλλα τεκμήρια ἐστὶ τοῦτο οὕτω ἔχειν, ἐν δὲ καὶ τόδε, ὅτι τε τοῦ Ἡρακλέος τούτου οἱ γονέες ἀμφότεροι ἦσαν Ἀμφιτρύων καὶ Ἀλκμήνη γεγονότες τὸ ἀνέκαθεν ἀπ᾽ Αἰγύπτου
>
> *Histories* 2.43
>
> "Now, I could supply a great deal of evidence to support the idea that the Greeks got the name of Heracles from Egypt, rather than the other way round, and that then the Greeks applied the name Heracles to the son of Amphitryon. I have a great deal of evidence pointing in this direction. Here is just one item: both parents of the Greek Heracles, Amphitryon and Alcmene, trace their lineage back to Egypt."

Note that the evidence is not strictly speaking empirical; it is common knowledge, but no can point to some observable proof that Amphitryon and Alcmene trace their lineage back to Egypt. Also, once again, the evidence provided comes from the archaic, and in this case, mythical past.

Next in Book 2, Herodotus is speaking concerning the religious rites of the Egyptians. At 2.58, Herodotus claims that the Egyptians were the first to perform religious activities and festivals:

> Πανηγύρις δὲ ἄρα καὶ πομπὰς καὶ προσαγωγὰς πρῶτοι ἀνθρώπων Αἰγύπτιοί εἰσι οἱ ποιησάμενοι, καὶ παρὰ τούτων Ἕλληνες μεμαθήκασι. Τεκμήριον δέ μοι τούτου τόδε· αἱ μὲν γὰρ φαίνονται ἐκ πολλοῦ τεο χρόνου ποιεύμεναι, αἱ δὲ Ἑλληνικαὶ νεωστὶ ἐποιήθησαν
>
> *Histories* 2.58
>
> "But anyway, the Egyptians were the first people in the world to hold general festive assemblies, and religious processions and parades, and the Greeks learnt from the Egyptians. My evidence for this suggestion is that these activities have obviously been going on in Egypt for a very long time, whereas they have only recently started in Greece."

Herodotus once again makes a claim about the deep, archaic past. He also here couches his language: "these things appear" (αἱ μὲν γὰρ φαίνονται) and the "evidence" is weakened by the μοι ("This is evidence of this fact, so far as I'm concerned").

The final use of τεκμήριον in Book 2 occurs much later, in section 104. Herodotus is arguing that the Colchians are Egyptian. Herodotus rightly notes that their physical characteristics (dark skin and curly hair) are not sufficient evidence of their Egyptian descent (these are not traits exclusive to Egyptian descent). Rather, their practice of circumcision confirms the genealogy. As "evidence" that other cultures borrow this prac-

tice from Egypt, Herodotus turns to anecdotal accounts that Phoenicians who meet Greeks and see their customs then stop circumcising:

> αὐτῶν δὲ Αἰγυπτίων καὶ Αἰθιόπων οὐκ ἔχω εἰπεῖν ὁκότεροι παρὰ τῶν ἑτέρων ἐξέμαθον: ἀρχαῖον γὰρ δή τι φαίνεται ἐόν. ὡς δὲ ἐπιμισγόμενοι Αἰγύπτῳ ἐξέμαθον, μέγα μοι καὶ τόδε τεκμήριον γίνεται: Φοινίκων ὁκόσοι τῇ Ἑλλάδι ἐπιμίσγονται, οὐκέτι Αἰγυπτίους μιμέονται κατὰ τὰ αἰδοῖα. ἀλλὰ τῶν ἐπιγινομένων οὐ περιτάμνουσι τὰ αἰδοῖα.
>
> *Histories* 2.104

> "The obvious antiquity of the custom in Egypt and Ethiopia prevents me from saying whether the Egyptians learnt it from the Ethiopians or vice versa, but what convinces me that the other peoples learnt it as a result of their contact with Egypt is that any Phoenicians who have come into contact with Greece have stopped copying the Egyptians with respect to their genitalia, and do not cut off their children's foreskins."

Notably, Herodotus begins by noting what he is unable to declare with any conviction ("whether the Egyptians learnt it from the Ethiopians or vice versa"). This prefatory remark explains why I have noted throughout the Book 2 passages that Herodotus consistently uses evidence from the archaic past. As he states explicitly here, evidence from the archaic past is not secure enough for strong assertions. While Herodotus does not preface every use of archaic τεκμήρια with such a reminder, it is applicable throughout. Also of note is the use, once again, of the weakening μοι (μέγα μοι καὶ τόδε τεκμήριον). This is something slightly different from the Hippocratic author's "proof," which stands alone to justify his claims. Herodotus appears to use τεκμήρια more as

"evidence" which he takes to be grounds for reasonable inference. There is a small yet important difference between "And the proof is" (τεκμήριον δ᾽) and "I take this to be good evidence" (μέγα μοι καὶ τόδε τεκμήριον).

Taken together, these instances of τεκμήρια in Book 2 simultaneously demonstrate the similarities and differences between Herodotus and the author of *AWP*. Both are clearly interested in offering the evidence upon which they infer their conclusions. Both frequently turn to empirical evidence. And both signal their reasoning with consistent proof-language. Yet there are clear differences as well. Herodotus is willing to use testimonials, common knowledge, as well as observable facts as evidence. One cannot see the Nile's flooding 900 years ago, one cannot sense Amphitryon and Alcmene's lineage. These are not empirical evidences. Moreover, Herodotus often presents his evidence not as strong "proof" but as evidence that seems reasonable to him. These trends can be seen in the other uses of τεκμήρια throughout the *Histories*.

τεκμήρια appear 3 more times in the *Histories*, in Books 3, 7, and 9. At. 3.38, Herodotus is coming off of his description of Cambyses' madness and makes the gnomic statement: "Each group would choose its own customs as the best in the world." In

order to support this grand, universal statement, Herodotus offers this one piece of "evidence":

> οὔκων οἰκός ἐστι ἄλλον γε ἢ μαινόμενον ἄνδρα γέλωτα τὰ τοιαῦτα τίθεσθαι: ὡς δὲ οὕτω νενομίκασι τὰ περὶ τοὺς νόμους πάντες ἄνθρωποι, πολλοῖσί τε καὶ ἄλλοισι τεκμηρίοισι πάρεστι σταθμώσασθαι, ἐν δὲ δὴ καὶ τῷδε. Δαρεῖος ἐπὶ τῆς ἑωυτοῦ ἀρχῆς καλέσας Ἑλλήνων τοὺς παρεόντας εἴρετο ἐπὶ κόσῳ ἂν χρήματι βουλοίατο τοὺς πατέρας ἀποθνήσκοντας κατασιτέεσθαι: οἱ δὲ ἐπὶ οὐδενὶ ἔφασαν ἔρδειν ἂν τοῦτο. Δαρεῖος δὲ μετὰ ταῦτα καλέσας Ἰνδῶν τοὺς καλεομένους Καλλατίας, οἳ τοὺς γονέας κατεσθίουσι, εἴρετο, παρεόντων τῶν Ἑλλήνων καὶ διὰ ἑρμηνέος μανθανόντων τὰ λεγόμενα, ἐπὶ τίνι χρήματι δεξαίατ᾽ ἂν τελευτῶντας τοὺς πατέρας κατακαίειν πυρί: οἱ δὲ ἀμβώσαντες μέγα εὐφημέειν μιν ἐκέλευον. οὕτω μέν νυν ταῦτα νενόμισται, καὶ ὀρθῶς μοι δοκέει Πίνδαρος ποιῆσαι νόμον πάντων βασιλέα φήσας εἶναι.
>
> *Histories* 3.38

> "There is plenty of other evidence to support the idea that this opinion of one's own customs is universal, but here is one instance. During Darius' reign, he invited some Greeks who were present to a conference, and asked them how much money it would take for them to be prepared to eat the corpses of their fathers; they replied that they would not do that for any amount of money. Next, Darius summoned some members of the Indian tribe known as Callatiae, who eat their parents, and asked them in the presence of the Greeks, with an interpreter present so that they could understand what was being said, how much money it would take for them to be willing to cremate their fathers' corpses; they cried out in horror and told him not to say such appalling things. So these practices have become enshrined as customs just as they are, and I think Pindar was right to have said in his poem that custom is king of all."

The evidence here might best be called testimonial. Once again, it is clearly not empirical. This is an anecdote. This time, however, Herodotus offers his claim with full fledged confidence. It simply is the case that "custom is king of all," as Pindar says. Now that Herodotus is not dealing with particular cultures or particular facts, but with universal truths, he offers evidence for a claim that is presented as truth.

In Book 7, at section 238, Herodotus has recounted the battle of Marathon and is detailing its aftermath. Herodotus notes that Xerxes had his soldiers decapitate Leonidas, which is "the most convincing evidence" that Leonidas most annoyed Xerxes:

> ταῦτα εἴπας Ξέρξης διεξήιε διὰ τῶν νεκρῶν, καὶ Λεωνίδεω, ἀκηκοὼς ὅτι βασιλεύς τε ἦν καὶ στρατηγὸς Λακεδαιμονίων, ἐκέλευσε ἀποταμόντας τὴν κεφαλὴν ἀνασταυρῶσαι. δῆλά μοι πολλοῖσι μὲν καὶ ἄλλοισι τεκμηρίοισι, ἐν δὲ καὶ τῷδε οὐκ ἥκιστα γέγονε, ὅτι βασιλεὺς Ξέρξης πάντων δὴ μάλιστα ἀνδρῶν ἐθυμώθη ζῶντι Λεωνίδῃ: οὐ γὰρ ἄν κοτε ἐς τὸν νεκρὸν ταῦτα παρενόμησε, ἐπεὶ τιμᾶν μάλιστα νομίζουσι τῶν ἐγὼ οἶδα ἀνθρώπων Πέρσαι ἄνδρας ἀγαθοὺς τὰ πολέμια. οἳ μὲν δὴ ταῦτα ἐποίευν, τοῖσι ἐπετέτακτο ποιέειν.
>
> *Histories* 7.238

> "After this discussion Xerxes made his way through the bodies of the dead. When he came to Leónidas' corpse and was told that this was the Lacedaemonian king and commander, he told his men to cut off his head and stick it on a pole. This, to my mind, is the most convincing piece of evidence (although there is plenty more) that during his lifetime Leónidas had been more of an irritation to King Xerxes than anyone else in the world. Otherwise he would never have aaed with such abnormal violence towards his corpse, because the Persians are normally the last people in the world, to my knowledge, to treat men who fight bravely with disrespect."

Herodotus again subjectivizes his claim ("it is clear to me"). Unlike above, this is not some universal claim; this is another very particular point that is supported by particular evidence. We would assume, also, that the evidence presented was originally testimonial and not observed by Herodotus himself.

Finally, in Book 9, Herodotus makes the grand claim that "the divine plays a part in human affairs" (τὰ θεῖα τῶν πρηγμάτων). While there is "plenty of convincing evidence" (πολλοῖσι τεκμηρίοισι), Herodotus offers us only one example:

> ὡς δὲ ἄρα παρεσκευάδατο τοῖσι Ἕλλησι, προσήισαν πρὸς τοὺς βαρβάρους: ἰοῦσι δέ σφι φήμη τε ἐσέπτατο ἐς τὸ στρατόπεδον πᾶν καὶ κηρυκήιον ἐφάνη ἐπὶ τῆς κυματωγῆς κείμενον: ἡ δὲ φήμη διῆλθέ σφι ὧδε, ὡς οἱ Ἕλληνες τὴν Μαρδονίου στρατιὴν νικῷεν ἐν Βοιωτοῖσι μαχόμενοι. δῆλα δὴ πολλοῖσι τεκμηρίοισι ἐστὶ τὰ θεῖα τῶν πρηγμάτων, εἰ καὶ τότε, τῆς αὐτῆς ἡμέρης συμπιπτούσης τοῦ τε ἐν Πλαταιῇσι καὶ τοῦ ἐν Μυκάλῃ μέλλοντος ἔσεσθαι τρώματος, φήμη τοῖσι Ἕλλησι τοῖσι ταύτῃ ἐσαπίκετο, ὥστε θαρσῆσαί τε τὴν στρατιὴν πολλῷ μᾶλλον καὶ ἐθέλειν προθυμότερον κινδυνεύειν.
>
> *Histories* 9.100

> "The Greeks completed their preparations and set out towards the Persian lines. As they were advancing, a rumour sped its way to the entire army and a herald's wand was seen lying on the beach; the rumour, which spread throughout the ranks, was that the Greeks had defeated Mardonius' army in a battle in Boeotia. There is plenty of convincing evidence that the divine plays a part in human affairs. Consider how on this occasion, with the Persian defeat at Plataea and their imminent defeat at Mycale happening on the same day, a rumour of Plataea reached the Greeks at Mycale, boosting their morale and making them even more willing to face danger."

The specific instance of news reaching the Greeks at Mycale concerning that battle of Plataea is Herodotus' only offered evidence for this claim. The evidence itself is once again distanced from direct assertion, as Herodotus couches the statement in a hypothetical (εἰ καὶ τότε). This is also far from empirical evidence; this is another example of testimonial evidence.

These final three uses of τεκμήρια confirm the trends seen in Book 2. Herodotus does not consistently use strictly empirical evidence, but often has recourse to testimonial evidence. He also does not consistently present his claims as certain truth; he often couches his claims in the subjective dative of reference or in hypotheticals. While the author of *AWP* only looks to empirical evidence to support his true inferences, Herodotus looks to various types of evidence to support reasonable inferences. I believes that this analysis of the τεκμήρια in the *Histories* proves our first claim, that Herodotus differs from the author of *AWP* in the types of evidence used. I have suggested that we can also see that second primary difference between the two texts in thee passages as well. Tonally, *AWP* confidently presents its inferences and their claims, while the *Histories* are more reserved. This second point, however, is more clearly seen in examining Herodotus' uses of the verb τεκμαίρομαι.

For Herodotus, to infer from evidence (τεκμαίρομαι) does not ensure knowledge. The first time Herodotus explicitly "infers", at 1.57, he is discussing the Pelasgians. He declares: “I am not in a position to say for certain (οὐκ ἔχω ἀτρεκέως εἰπεῖν) what language the Pelasgians used to speak, but if it is appropriate to infer (εἰ δὲ χρεόν ἐστι τεκμαιρόμενον λέγειν) from those Pelasgians who still exist today … inferring from

them (εἰ τούτοισι τεκμαιρόμενον δεῖ λέγειν), the Pelasgians spoke a non-Greek language." Here Herodotus states explicitly that "infering from sure signs" does not necessitate "exact" (ἀτρεκέως) knowledge. In this inference, the implied τεκμήριον is the observed fact that contemporary Pelasgians speak a barbaric language. This is empirical evidence. Yet contrary to the boldness of *AWP*'s inferences, Herodotus explicitly marks this inferential conclusion as uncertain. He recognizes that signs are evidence for hypothetical reasoning with two degrees of separation. So here, if all Pelasgians spoke like current Pelasgians, and current Pelasgians speak a barbaric language, then all Pelasgians spoke a barbaric language. Not only does such reasoning rest upon assumptions that cannot be proven or observed (that archaic Pelasgians spoke that modern Pelasgians), it is once again a claim about the archaic past. The invisibility of the past appears to restrain Herodotus from any form of strict empiricism.

In another passage from Book 2, Herodotus offers another gnomic statement on inference that simultaneously brings him together with the Hippocratic author of *AWP* and separates them. In discussing the length of the river Ister and the Nile, Herodotus declares:

> Τὸν δὲ δὴ ποταμὸν τοῦτον τὸν παραρρέοντα καὶ Ἐτέαρχος συνεβάλλετο εἶναι Νεῖλον, καὶ δὴ καὶ ὁ λόγος οὕτω αἱρέει. Ῥέει γὰρ ἐκ Λιβύης ὁ Νεῖλος καὶ μέσην

> τάμνων Λιβύην· καὶ ὡς ἐγὼ συμβάλλομαι τοῖσι ἐμφανέσι τὰ μὴ γινωσκόμενα τεκμαιρόμενος, τῷ Ἴστρῳ ἐκ τῶν ἴσων μέτρων ὁρμᾶται. Ἴστρος τε γὰρ ποταμὸς ἀρξάμενος ἐκ Κελτῶν καὶ Πυρήνης πόλιος ῥέει μέσην σχίζων τὴν Εὐρώπην
>
> *Histories* 2.33
>
> "Etearchus came to the conclusion that the river which the town was on was the Nile. Now, this makes sense, in fact, because the Nile cuts through the middle of Libya before entering Egypt from there, and since we may draw on the familiar to understand the unknown, I reckon that its total length is the same as that of the Ister. The Ister rises in the land of the Celts, at the city of Pyrene."

Thomas spends time articulating the ways in which this statement situates Herodotus' thinking within the more standard intellectual world view of his time as well as within the burgeoning scientific discourses typified by the Hippocratics.[28] In inferring about the invisible from the visible, Herodotus clearly associates his methodology with that of the Hippocratics, yet as the passage above demonstrates, Herodotus and the author of *AWP* have differing views of the power of inference. Thus, while this passage, on its face, looks highly similar to the concluding passage of *AWP* (ἀπὸ δὲ τουτέων τεκμαιρόμενος τὸ λοιπὰ ἐνθυμέεσθαι, καὶ οὐχ ἁμαρτήσῃ, 24.49), the absence of any phrase like "without error" points to a major point of departure. Herodotus may "inferentially reason about the invisible by taking the visible as signs of the invisible" (2.33),

[28] Thomas 2000: 201: "While Herodotus' liking for analogy and symmetry in his vision of the world may well have roots in a more traditional world view, the manner in which he introduces, explains and defends his use of such analogy, belongs to this particular mode of discourse."

inference is not error-proof. Often, when inferring, one "cannot say for certain" (οὐκ ἔχω ἀτρεκέως εἰπεῖν, 1.57) that the conclusion reached is true.[29]

Inferential reasoning is presented as reasonable opinion in Herodotus, as assent-worthy knowledge in AWP.Evidence in Herodotus is of variable types, in AWP it is consistently empirical/observable.

[29] I have skipped the final two occurrences of the verb τεκμαίρομαι in the interest of space. Both passages occur in narrative portions of the text and add little to this analysis. Both occur in Book 7 and concern Xerxes: 7.16 and 7.234.