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# A Tribute to Reality?

## Herodotus and the Persian Tribute List (3.89-97)

Joseph B. Ruter III

Imagine an empire equal to the Roman Empire in every way: same length of rule (as the Western Empire), same population, and the same broad spread of imperial rule. Imagine an attempt to study this vast empire with only a handful of inscriptions, a few fire-baked administrative records, and the later literature of its enemies. Although such an empire is hard to imagine, the Achaemenid Empire is just such an empire.

In order to understand the fiscal machinery of the Achaemenid Empire, the majority of scholars have relied more or less uncritically on Herodotus' Persian Tribute List (3.89-97). After Darius I ascends the Persian throne, Herodotus relates a list of the twenty tribute regions along with their amounts of tribute to the Achaemenid Empire.<sup>1</sup> As Pierre Briant says in his magisterial account of Persian history, "it is apparent that the numerical information Herodotus gives must be considered reliable."<sup>2</sup> Despite Briant's certainty, other scholars including O. Kimball Armayor doubt the accuracy of Herodotus' figures.<sup>3</sup> To gauge the accuracy of his figures and by implication the quality of his sources, I will compare Herodotus' Persian Tribute List with the nearest record of regional taxation: the Athenian tribute list. Before that comparison, however, I will access Armayor's radical argument against the accuracy of Herodotus' list. I conclude that since Herodotus inflated the tribute of his first *nomos* Herodotus had no official source for his tribute list.

Before I attempt to access the numbers of Herodotus' Persian Tribute List, I should address the radical argument of scholar O.

Kimball Armayor. From his analysis of archeological evidence, Armayor argues that the contents of Herodotus' Persian Tribute List derive not from Persian evidence but from Greek literary tradition.<sup>4</sup> On the one hand, the tribute list includes approximately 42 nations undocumented in any of the available inscriptions, including the six entire *nomoi* (or satrapies). Herodotus also misplaces and misnames several major nations.<sup>5</sup> On the other hand, the tribute list numbers the *nomoi* following in Greek rather than a Persian manner. Whether in Behistun or in Suez, Achaemenid inscriptions describe consistently the empire nation by nation from the Persian heartland of Persis to its farthest periphery. By comparison, Herodotus enumerates the *nomoi* from his native Ionia eastwards in a generally geographic way.<sup>6</sup> While Herodotus might be forgiven for "greeking up" his list, Herodotus cannot by his own principle of division explain his bizarre union of Armenia and India-bordering Pactyike into *nomos* XIV.<sup>7</sup> Since Herodotus' list fails to match Persian evidence, Armayor proposes another source for the content of his list.

From a number of oddities in the Persian Tribute List, Armayor proposes instead that Herodotus concocted his list from his Ionian literary tradition of logography and epic poetry. First, although Herodotus adds together his first 19 *nomoi* to derive his pre-Indian total of 7600 Babylonian talents, Herodotus' sum could simply derive from the multiplication of his *nomoi* and his calculation of Ionian tribute. Unlike the other *nomoi*, Herodotus could reasonably estimate the amount of the tribute here, whether relying upon Artaphernes' assessment of 493 (VI. 42) or perhaps upon Athenian tribute figures of the 440's.<sup>8</sup> Second, several numbers of literary significance tend to recur. For instance, the favored number of the Babylonians 360 recurs for the tax levy of four districts and the Cilician horse imposition. For a second instance, Herodotus names 67 nations in his tribute list and 67 contingents in his army list. Homer, as Armayor observes, names 67 commanders in the *Iliad*. To explain these instances, Armayor suggests that Herodotus borrowed from the logographic tradition of Hecataeus and the poorly understood Homeric tradition of epic

catalogue. While some of Herodotus' numbers add suspiciously, I do not reckon Herodotus' account a mere literary addition.

While Armayor points out a number of important geographic faults in Herodotus' list, I think that Armayor's wholesale rejection of Herodotus is unfounded. Due to the cultural and language barriers, even if Herodotus had official or semi-official sources, Herodotus would have likely erred about the precise placement of peoples and taxes. Furthermore, even if Herodotus had consciously structured his list in a tradition of epic catalogue, he could still have had true information about the Persian system from his travels and from his Ionian upbringing.<sup>9</sup> In fact, two of Herodotus' claims about the Persian tax system can be corroborated with other evidence.

First, recent ethnographic reports have confirmed the essence of Herodotus' claim that Indians collected their gold for tax payments from animal activity, even if Herodotus reported marmots as large ants. As Herodotus explains with digressions and detail in Book 3.102-105, the residents of northern India (i.e. modern Pakistan) travel into the deserts of eastern India (i.e. modern Tibet) in mid-day to gather gold surfaced by the ants. Due to the aggressiveness of the ants, the Indians brought camels for the ants to eat while the Indians escaped with their gold. In recent years, through, ethnologist Michel Peissel has confirmed the essence of Herodotus' story through an investigation of Minaro tribe's claim to have gleamed gold from marmots in the past.<sup>10</sup> Furthermore, classicist Thomas Reimer notes that in Hellenistic accounts the ants are described to have spotted skins like the marmots.<sup>11</sup> With the essence of his claim confirmed, the question becomes why Herodotus confounds the details.

Herodotus errs on the details of his account because of his sources from which he distances himself. While Peissel suggests that Herodotus' confusion emerged from the shared Persian word for marmot and for mountain ant, I suspect that the shared word reflects the Persian confusion about the sources of the gold.<sup>12</sup> As Reimer observes, the frontier tribes who collected the gold from the marmots and mines of western Tibet had an incentive not to report to the

Persians the ease of its collection. Had the tribes told the Persians the truth, the Persians would have increased their tax assessments, while other tribes would have entered the area.<sup>13</sup> To reduce their tax burdens, the tribes invented the aggressive ants. Besides stopping Persian inspections, the aggressiveness of the ants justified the limited quantities of gold: to procure a few handfuls required the sacrifice of multiple camels.<sup>14</sup> To his credit, through, Herodotus distances himself from his sources, saying “the Persians say” twice in reference to the unlikely proposed process to take gold from the ants (3.105). Despite the suggestiveness of Herodotus’ accuracy about Indian gold acquisition (or at least Persian perceptions thereabout), Herodotus has another claim more directly corroborated with evidence.

Second, both archaeological and literary evidence confirm Herodotus’ claim that the Persian Kings hoarded surplus silver and gold from tribute collections. After reckoning that Darius collected from all sources approximately the value of fourteen thousand five hundred and sixty Eubolic talents (3.95), Herodotus explains:

τοῦτον τὸν φόρον θησαυρίζει βασιλεὺς τρόπῳ τοιῷδε: ἐς πίθους κεραμίνους τήξας καταχέει, πλήσας δὲ τὸ ἄγγος περιαιρέει τὸν κέραμον: ἐπεὶ δὲ δεηθῆ ἡ χρημάτων, κατακόπτει τοσοῦτο ὅσου ἂν ἐκάστοτε δέηται (3.96).

The tribute is stored by the king in this fashion: he melts it down and pours it into earthen vessels; when the vessel is full he breaks the earthenware away, and when he needs money coins as much as serves his purpose (Trans. Godley).

If the 7,200 Babylon talents of silver from the first nineteen *nomoi* are considered alone, Darius collected approximately 476,199 pounds or approximately 238 tons of silver each year.<sup>15</sup> Although Herodotus proposes a tribute of almost unimaginable heft and breath, it is not necessarily unobtainable.

Because of its bureaucratic and logistical sophistication, the Achaemenid Empire would have had the capacity to collect tributes comparable to Herodotus'. In general, it is easy to underestimate the transportation capacities of the ancient world. Only a few hundred years later, Augustus managed the importation of 400,000 tons of grain from North Africa and Egypt to support Rome's *annona* or grain distribution.<sup>16</sup> Although the geography of the Achaemenid Empire is less favorable to transportation, since the Empire had a desert rather than sea at its center, the infrastructure investments of the Empire including an extensive royal road system and canal system equaled out the speed of transport.<sup>17</sup> Beyond its physical infrastructure, the Achaemenid Empire had an extensive bureaucratic infrastructure, which could plausibly coordinate the hundreds of donkeys and ships necessary to carry 238 tons of silver.<sup>18</sup> To supply official travelers in the military and the civilian service, the Empire had a system of supply depots spaced a day's journey apart on the major royal routes. For the operation of the depots, the Empire developed a bureaucracy and a bureaucratic process to authorize provisions for travelers from Ionia to India. In fact, within the preserved records of the Persepolis Tablets, there is a whole category of so-called *helmi* tablets for this purpose.<sup>19</sup> Given the evidence for the Achaemenid Empire's advanced logistical capacities, the collection of tribute on a Herodotian scale becomes possible.

Had Darius I and his successors hoarded tribute, as Herodotus describes, their activity would have impacted the economies of both the Achaemenid Empire and its Hellenistic successor states. Since the Achaemenid emperors would have likely collected as much or more silver than produced each year, given Herodotus' numbers, the supply of silver available for currency and trade within the empire would have declined over time.<sup>20</sup> With a reduced supply of silver, the price of silver would have steadily increased within the Achaemenid lands. Since commerce within the majority of the empire depended upon silver, its ballooning price would have deflated the economy as a whole.<sup>21</sup> In Babylonia, where Herodotus assigns the second highest

tax payment after India, high tax payments stalled its previous economic growth under the Neo-Babylonian Empire, reserving partly the monetization and urbanization of its economy.<sup>22</sup> Since Babylonia lacks its own silver mines, the merchants of Babylonia had to import silver, diverting capital from other more productive agricultural investments. To pay the merchants for their silver, landholders pledged their lands and their hands. As tax obligations mounted, merchants like Murasu family and Persian officials came to control the majority of Babylonian land and peasants in the equivalent of the Roman *latifundia* system, suppressing local demand for goods.<sup>23</sup> While the slowdown of the Babylonian economy in this period is suggestive of Herodotus' tribute, the aftermath of Alexander the Great's conquest is conclusive.

During his conquest of the Achaemenid Empire, Alexander the Great coined silver of the Achaemenid treasury as documented by literary sources and as confirmed by economic sources. As Arrian, whom historians consider the best source for the campaign of Alexander the Great, reports:

ἀφίκετο δὲ ἐς Σοῦσα Ἀλέξανδρος ἐκ Βαβυλῶνος ἐν ἡμέραις εἴκοσι: καὶ παρελθὼν ἐστὴν πόλιν τὰ τε χρήματα παρέλαβεν ὄντα ἀργυρίου τάλανταὲς πεντακισμῦρια καὶ τὴν ἄλλην κατασκευὴν τὴν βασιλικὴν (3.16.7).

Alexander arrived in Susa from Babylon on day twenty, and having come into the city he got possession of the goods and fifty thousand talents of silver and the other royal fixtures. (Trans. A.G. Roos)

Corroborating Arrian, Plutarch and Diodorus Siculus also record Alexander the Great's receipt of the Persian treasury, which Alexander managed to disperse approximately two-thirds of in his short lifetime to his soldiers.<sup>24</sup> Due to the amount of "new" silver, estimated at 180000 talents of silver, the economy of the Greek world

underwent a period of economic expansion and price inflation. New cities and the new urbane lifestyle of the Hellenistic period emerged, stimulating new industry and commerce. Unlike the Achaemenid period, where silver proved too precious for personal wares, silverware became commonplace enough among the upper classes of Hellenistic society to become an essential marker of societal status.<sup>25</sup> Due to this economic expansion, prices rose for basic commodities like Delian olive oil until about 300 B.C.E. when the silver freed from the Achaemenid treasury began to enter the treasuries of their successors.<sup>26</sup> From this economic evidence, then, it is clear that Achaemenid emperors hoarded silver as Herodotus claimed.

Since Herodotus knew about the source of India's gold and its destination for storage, he seems to have had an official or semi-official source for his work, suggesting that his ethnographic errors stem from cross-cultural misunderstanding. If he had an official or semi-official source, he could have obtained realistic estimates of the amount of tribute that the Achaemenids received from their *nomoi*. Due to the poor preservation of Persian records, I unfortunately cannot check Herodotus against the Persians themselves.

With a few reasonable assumptions, however, it becomes possible to access the revenue of Herodotus' first *nomos* against the Athenian tribute list. By the "Athenian tribute list," I refer to a set of stone inscriptions that detail the offerings of surplus tribute to the Treasury of Athena.<sup>27</sup> Since the offerings were always one sixteenth of the total surplus tribute, scholars can with simple multiplication calculate the total amount of surplus tribute or the amount of tribute net of the localized military expenditures.<sup>28</sup> Although unstated in Herodotus' account, it is reasonable to believe that the tribute figures of his list reflect surplus tribute rather than total tribute. Beyond the similarity of collection type, it is fair to assume a similar level of taxation relative to the economic output of the first *nomos*. Because of its proximity to that the Achaemenid Empire, the Athenians could have easily "persuaded" the residents of the region to pay tribute at the set level of Artaphernes' 493 assessment (VI. 42). Furthermore,



since the Achaemenids set tribute enough to stall the economic growth of Babylonia, their tax demands upon the first *nomos* would have had the same effect, even if the availability of silver mines and Athenian silver imports into *nomos* mitigated some of the adverse effects on the region's money supply. With these assumptions, I can derive an estimate of the *nomos*' tribute from an interpolation of the Athenian tribute list.

If I can estimate the percentage of the first *nomos*' land under the Delian League, I can estimate the *nomos*' tribute based upon several premises about the ancient economy. Since production technology remained undeveloped within the Achaemenid Empire, even when compared to the Roman Empire, economic output depended almost entirely on the amount of labor available.<sup>29</sup> In turn, the amount of available labor depended upon the ability to feed the laborers, whether through the produce of local farmland or through imported produce. Due to the tight money supply, the cities of the first *nomos* could not have imported significant amounts of grain into the region, limiting the region's population size to its agricultural productivity. Furthermore, since modern experts classify the land of the first *nomos* into the same agricultural region, it is reasonable to believe that the land of the *nomos* in ancient times would have shared the same agricultural region, given the historical stability of Turkish agriculture.<sup>30</sup> Given the shared region, the land of the first *nomos* would have yielded the same produce on average. As such, with the percentage of the first *nomos*' land under the Delian League, I estimate the tribute of the *nomos*.

Since the first *nomos* encompasses all the "Greeks" of the Achaemenid Empire, whose primary settlement was on the coastal plains of the Aegean and of the Mediterranean Sea, the Athenians controlled approximately 60-80% of the *nomos*. As Herodotus describes the first *nomos* in 3.90,

ἀπὸ μὲν δὴ Ἴωνων καὶ Μαγνήτων τῶν ἐν τῇ Ἀσίῃ καὶ  
Αἰολέων καὶ Καρῶν καὶ Λυκίων καὶ Μιλυέων καὶ Παμφύλων

(εἷς γὰρ ἦν οἱ τεταγμένους οὗτος φόρος προσήιε τετρακόσια  
τάλαντα ἀργυρίου,

The Ionians, Magnesians of Asia, Aeolians, Carians, Lycians, Milyans, and Pamphylians, on whom Darius laid one joint tribute, paid a revenue of four hundred talents of silver. This was established as his first province. (Trans. Godley)

In each case, Herodotus refers to peoples rather than to places. However, since all of the peoples either spoke dialects of Greek or were represented the Delian League, all of these peoples would have settled within the coastal plains of the Aegean and of the Mediterranean Sea rather than in the interior, following the typical pattern of settlement prior to Alexander the Great.<sup>31</sup> Since the Athenians controlled the majority of major coastal cities within the region, as demonstrated in visualization from the Stanford Polis Project in Appendix IV, it is reasonable to assume that the Athenians from approximately 60-80% of the first *nomos*' land.

Given the previous assumptions, then, I estimate based upon the Athenian Tribute list of 450 BCE that the first *nomos* could have yielded between 99.45 and 132 Babylonian talents. First, I computed the number of talents that the Athenians received from their Ionian-Caric fiscal district as approximately 132.60 talents.<sup>32</sup> Since the Athenian tribute list never specifies the currency of its figures, scholars generally assume that the list was denominated in Athenian *drachmae*, evidenced through the fractional numbers of the list.<sup>33</sup> Second, I adjusted the figure for province size, leading to a tribute between 165.75 and 220 Athenian talents. Third, I translated Athenian talents into Babylonian talents, using the common 3/5 conversation rate.<sup>34</sup> By these calculations, I estimate that the first *nomos* yielded between 99.45 and 132 Babylonian talents. Since Herodotus reports 400 Babylon talents as the tribute, Herodotus inflated the tribute of Ionia significantly, even given a wide margin of error.

I conclude that since Herodotus inflated the tribute of his first *nomos* Herodotus had no official source for his tribute list. While Herodotus may not have had an official source for his tribute list, Herodotus had semi-official sources with enough knowledge to point out both the Indian gold trade and the Persian tribute storage. Given Herodotus' background, I suspect that he conversed with Greek merchants and ambassadors to gather facts for his *History*. In either case, scholars should be more critical of Herodotus' numbers in their attempts to reconstruct the Persian taxation system. As to why Herodotus offers inflated numbers, I believe that he choose his numbers to communicate the comparative scale of the Achaemenid Empire to his Athenian audience, drawing from an underexplored tradition about number. Suffice it to say, Herodotus aims not necessarily to account for fact, but for truth.

## Notes

<sup>1</sup> See Appendix I for a table of the list.

<sup>2</sup> Briant 2002: 392.

<sup>3</sup> Armayor 1973

<sup>4</sup> Armayor (like Laird 1921) uses evidence from Herodotus' List of Armies (VII.60-100) for his argument. Due to the sheer length of the list, I will not attempt to address Herodotus' list in detail. Because of its relevance, I will outline Armayor's argument against its veracity. Since Herodotus claims to characterize the actual Persian army on parade, Herodotus' depiction should align with the pictorial evidence of Persepolis, especially since Herodotus' fellow Ionians crafted the depictions for the Persians. However, Herodotus failed to describe either the Persians or more exotic nations properly, confusing weapon and armor types throughout. See Armayor 1973: 4-6 for his full assessment.

<sup>5</sup> Armayor 1973: 3.

<sup>6</sup> Laird 1921: 305. While India would be expected after XVI, Herodotus holds India until the end of his list to distinguish its golden payment from the silver payments of the other provinces. Furthermore, its terminal position allows Herodotus to transition more naturally into his digression about the ethnology of India. I will discuss his comments about India further later.

<sup>7</sup> Laird 1921: 306. Laird critiques at length the common explanation that Herodotus refers to less famous Armenia-bordering nation of Pactyans. During his Indian digression, Herodotus in fact refers to the Pactyans' land as bordering India (III.102). During List of Armies, Herodotus mentions the Pactyans with several other eastern peoples including the Sarangians and Utians (VII.68).

<sup>8</sup> Armayor 1973: 7. Since Herodotus composed his *Histories* around 440 BCE in Athens, Herodotus would have had access to the official tribute list of the Delian League from marble stelae. On the eve of the Peloponnesian War in 431 BCE, Athenians earned approximately 390 talents from the Delian League. Even if we assume slightly lower revenue before this, the amount would still round to approximately 400 talents. For a further discussion of Delian League revenues, see Unz 1985.

<sup>9</sup> Herodotus claims in the *Histories* to have traveled the Persian Empire extensively from the Black Sea to the Nile and from Ionia to Mesopotamia. While the majority of scholars including Casson 1994 believe Herodotus' claims, Armayor argues that because of his ethnographic gaffes Herodotus clearly never traveled to these places. See Armayor 1978 for his arguments against Herodotus' Black Sea travel and Armayor 1980 for his arguments against Herodotus' Egyptian travel. For my part, I am willing to accept Herodotus' claims in light of the cultural and language barriers.

<sup>10</sup> See Peissel 1983 for further details.

<sup>11</sup> Reimer 2006: 169.

<sup>12</sup> Peissel 1983: 100.

<sup>13</sup> Reimer 2006: 176. Gold rush areas have a long history of such supernatural scare strategies. Even during the California gold rush, prospectors crafted a similar tale of a "gold ghost" to scare off prospectives.

<sup>14</sup> *Ibid.*, 176-7. Reimer speculates that ants would have particularly terrified the Persians as Zoroastrians: ants emerge from the underworld. Due to the limited documentation for Zoroastrian practice at this time, I hesitate to consider this more than speculation.

<sup>15</sup> According to modern estimates, a Babylon talent is approximately 30 kilograms.

<sup>16</sup> Casson 1979: 21.

<sup>17</sup> Colburn 2013: 48. Despite imperial investments, the Achaemenid Empire would have still relied more heavily on higher cost land transport than the Roman Empire. While the relative high cost would hinder the transport of

bulk commodities like grain, silver would have suffered no effect. See also Briant 2002:357-387.

<sup>18</sup> Colburn 2013: 32. Colburn notes the surprisingly large carrying capacity of donkeys (330 pounds) and of camels (660 pounds). If maximally laden, approximately 1444 donkeys or 722 camels would be required to carry the Persian tribute.

<sup>19</sup> See Briant 2002: 364 for an example *helmi* and further explanation.

<sup>20</sup> Patterson 1972: 228. Using an economic model of silver production and accumulation, Patterson estimates that an average of 25 tons of silver were produced during 350 B.C.E.-250 B.C.E. Since production techniques remained unchanged between circa 500 B.C.E. and the period of his estimate, it is reasonable to assume a comparable average annual production.

<sup>21</sup> Spengler 1955: 280.

<sup>22</sup> Jursa 2014: 34.

<sup>23</sup> Van der Spek 2011: 407. Necessity to obtain silver for tax collections proved a problem in Judea too. As the prophet Nehemiah laments, ‘We have borrowed money for the king’s tribute, and that upon our lands and vineyards’, with the consequence that ‘other men have our lands and vineyards’ (5: 4–5).

<sup>24</sup> See Plutarch, *Life of Alexander*, 31 and Diodorus Siculus, XVII, 66, 71

<sup>25</sup> Panagopoulou 2007:315.

<sup>26</sup> Michell 1946: 4.

<sup>27</sup> Samons 2000: 35.

<sup>28</sup> I follow Unz 1985’s reading of the Athenian Tribute list in light of Thucydides.

<sup>29</sup> See Wilson 2002 for an enlightening account of Roman developments in production technology.

<sup>30</sup> Erinç and Tunçdilek 1952: 194.

<sup>31</sup> See Appendix II for a map of Greek poleis from the Stanford Polis Project.

<sup>32</sup> I use the figures of Merritt, Wade-Gary, and McGregor 1952: 52-58.

<sup>33</sup> When the Athenians imposed taxes, the reasoning goes, the Athenians would have charged whole numbers to simplify their accounting. Since the list includes fractional numbers, the Athenians had to have translated regional currencies into the unified reporting currency of the drachma. See Eddy 1973 for this argument.

<sup>34</sup> Hallock and Wade 1906: 27

### Works Cited

- Armayer, O. Kimball. 1973. "Herodotus' Catalogues of the Persian Empire in the Light of the Monuments and the Greek Literary Tradition." *Transactions of the American Philological Association*. 108: 1-9.
- Armayer, O. Kimball. 1978. "Did Herodotus Ever Go to the Black Sea?." *Harvard Studies in Classical Philology*. 82: 45-62.
- Armayer, O. Kimball. 1980. "Did Herodotus ever go to Egypt?" *Journal of the American Research Center In Egypt*. 15: 59-71.
- Arran. 1907. *Flavii Arriani Anabasis Alexandri*. Trans. A.G. Roos. in *aedibus B. G. Teubneri*. Leipzig.
- Briant, Pierre. 2002. *From Cyrus to Alexander : A History of the Persian Empire*. Winona Lake, IN: Eisenbraun.
- Casson, Lionel. 1979. "The Role of the State In Rome's Grain Trade." In *Memoirs of the American Academy in Rome*. J.H. D'Arms and Kopff, E.C. eds. Rome: American Academy in Rome. 21-9.
- Colburn, Henry P. 2013. "Connectivity and Communication in the Achaemenid Empire." *Journal Of The Economic & Social History Of The Orient* 56. 1: 29-52.
- Eddy, Samuel K. 1973. "Some Irregular Amounts of Athenian Tribute." *The American Journal of Philology*. 94: 47-70.
- Erinç, S, & Tunçdilek, N. 1952. "The Agricultural Regions of Turkey." *Geographical Review*. 42: 179-203.

- Hallock, William, and Herbert T. Wade. 1906. *Outlines of the Evolution of Weights and Measures and the Metric System*. New York, NY, The Macmillan Company.
- Herodotus. 1926. *Herodotus, with an English Translation by A. D. Godley*. Trans. Godley, A.D. Cambridge, MA.: Harvard University Press.
- Jursa, M. 2013. "The Babylonian Economy in the Sixth Century BC: Economic Growth in an Imperial Context." *Studi Storici* 54. 2: 247-268.
- Laird, A. G. 1921. "The Persian Army and Tribute Lists in Herodotus." *Classical Philology*. 16: 305-26.
- Meritt, Benjamin Dean, Henry Theodore Wade-Gery, and Malcolm Francis McGregor. 1953. *The Athenian Tribute Lists*. Princeton, NJ, The American School of Classical Studies at Athens.
- Michell, H. 1946. "The Impact of Sudden Accessions of Treasure upon Prices and Real Wages." *The Canadian Journal of Economics and Political Science / Revue Canadienne d'Economique et de Science Politique*. 12: 1-17.
- Panagopoulou, Katerina. 2007. "Between Necessity and Extravagance: Silver as a Commodity in the Hellenistic Period." *The Annual of the British School at Athens*, 102: 315-343.
- Patterson, C. C. 1972. "Silver Stocks and Losses in Ancient and Medieval Times." *Economic History Review* 25, no. 2: 205-235.
- Peissel, Michael. 1984. *The Ant's Gold: The Discovery of the Greek El Dorado in the Himalayas*. New York, NY. HarperCollins Publishers Ltd.

- Reimer, Thomas. 2006. "Larger than Foxes – but Smaller than Dogs: The Gold-Digging Ants of Herodotus." *Reinardus*. 19: 167-178.
- Samons, Loren J. 2000. *Empire of the Owl : Athenian Imperial Finance*. Stuttgart : Steiner.
- Spengler, Joseph J. 1955. "Herodotus on the Subject Matter of Economics." *The Scientific Monthly* 81: 276-285.
- Unz R., K. 1985. "The Surplus of the Athenian *Phoros*." *Greek, Roman And Byzantine Studies*. XXVI: 21-42.
- Van der Spek, Robartus J. 2011. "The 'Silverization' of the Economy of the Achaemenid and Seleukid Empires and Early Modern China." In *The Economies of Hellenistic Societies*. Zosia H Archibald, John Kenyon Davies, and Vincent Gabrielsen, eds. Oxford, Oxford University Press. 402-420.
- Wilson, Andrew. 2002. "Machines, Power and the Ancient Economy." *The Journal of Roman Studies*. 92:1-32.



**Appendix I**

<b>Nome</b>	<b>Peoples</b>	<b>Tribute in Talents</b>	<b>Non-Monetary Tribute</b>
I	Ionians, Magnesians in Asia, Aeolians, Lycians, Milyans, Pamphylians	400	
II	Mysians, Lydians, Lasonians, Cabalians, Hytennians	500	
III	[Hellespontine] Phrygians, Thracians of Asia, Paphlagonians, Mariandynians, Syrians	360	
IV	Cilicians	500	360 white horses
V	Posideium to Egypt (Arabs exempted)	350	
VI	Egypt, Libyans, Cyrene, Barca	700	Income from the fish of Lake Moeris +120,000medimnesof wheat for the Persian garrison at Memphis
VII	Sattagydiens, Gandharans, Dadicae, Aparytae	170	
VIII	Susa and the country of the Cissians	300	
IX	Babylonia and the rest of Assyria	1000	500 young eunuchs

X	Ecbatana, the rest of Media, Paricanians, Orthokorybantes	450	
XI	Caspians, Pausicae, Pantimathi, Daritae	200	
XII	Bactrians and . . . (?)	360	
XIII	Pactyans, Armenians, and neighboring peoples as far as the Pontus Euxinus	400	
XIV	Sagartians, Sangians, Thamanaeans, Utians, Myci, and inhabitants of the Erythrean Sea	600	
XV	Saka and Caspians	250	
XVI	Parthians, Chorasmians, Sogdians, Arians	300	
XVII	Paricanians, Ethiopians of Asia	400	
XVIII	Matieni, Saspies, Alarodians	200	
XIX	Moschians, Tibarenians, Macrones, Mossynoeci, Mares	300	
XX	Indians	360 (Gold- Euboic Talents)	

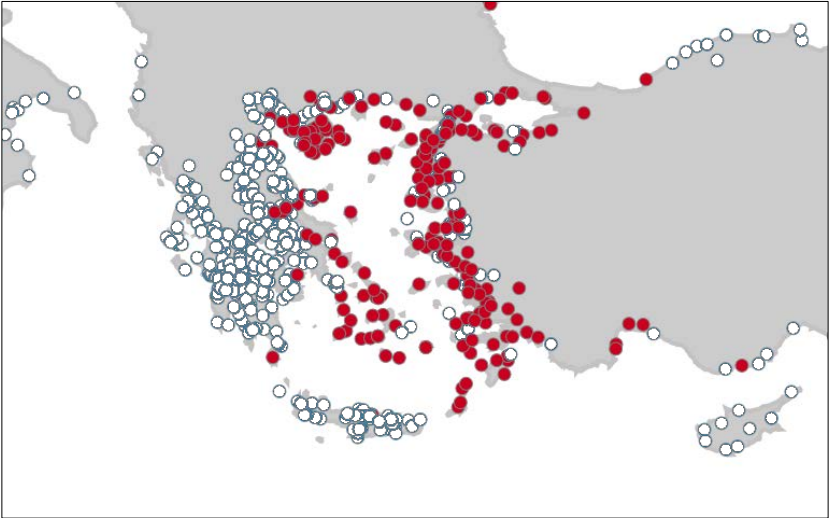
(Silver: Babylonian Talents). Adapted from Briant 2002: 391

## Appendix II



Created through the Stanford Polis Project data visualization tool ([polis.stanford.edu](http://polis.stanford.edu)), this map shows majority Greek cities that were founded prior to 400 BCE in the Greek mainland and Asia Minor.

### Appendix III



Created from the map of Appendix III in the Stanford Polis Project, this map shows known Delian League cities as dots and known non-Delian Cities as circles.